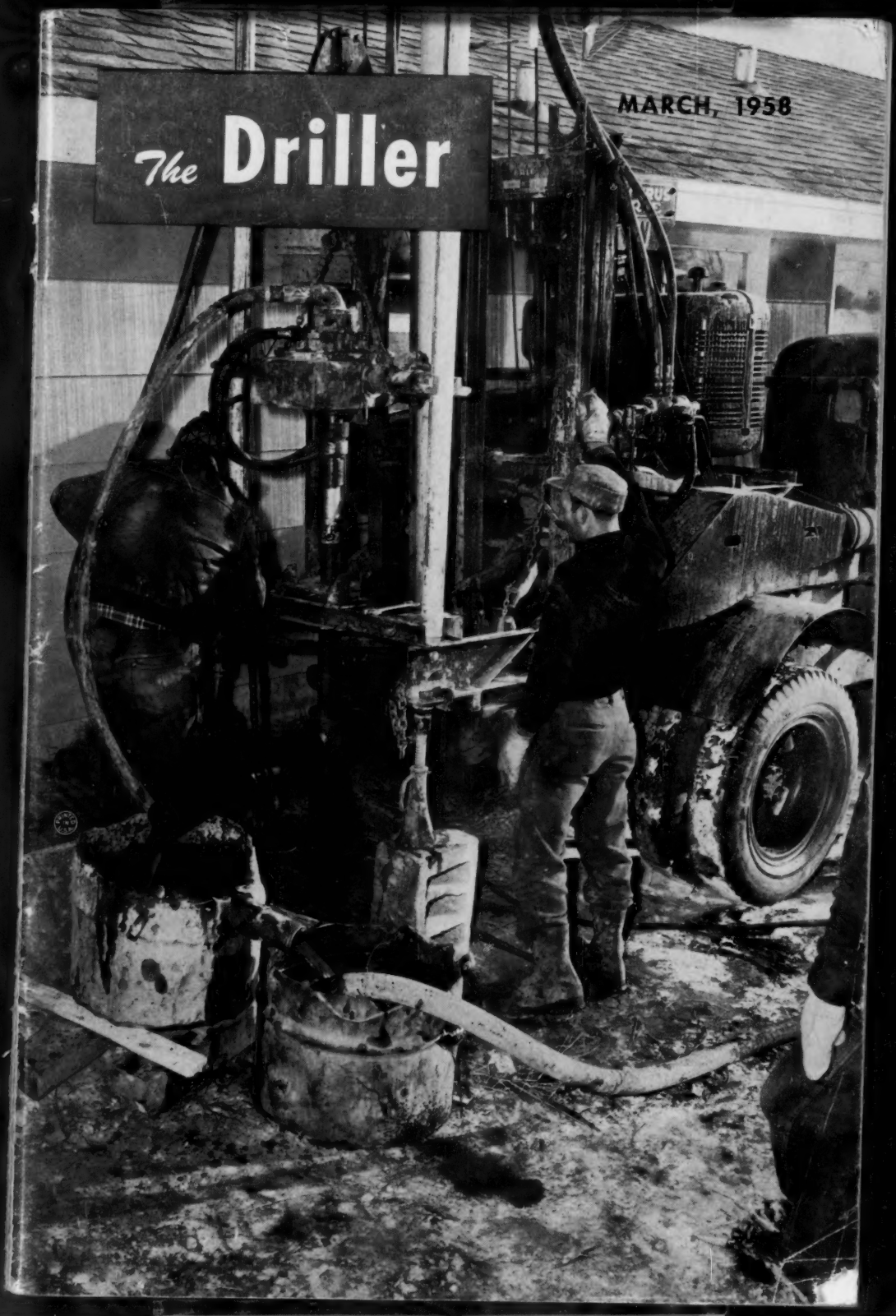
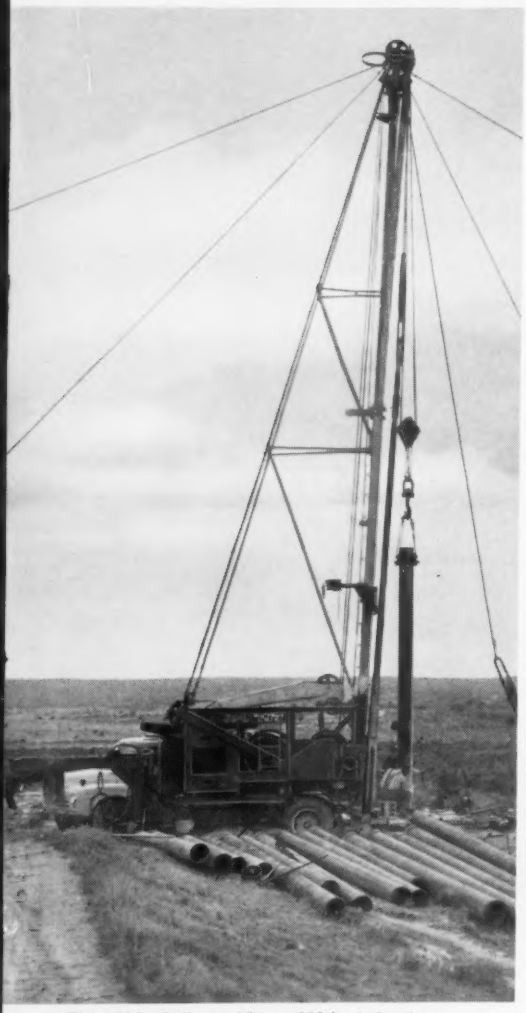

The Driller
MARCH, 1958

Survey PROOF!

Drillers prefer Bucyrus-Eries 2 to 1 over all other makes combined



This 60-L drills a 15-in., 250-ft. irrigation well for U.S. Bureau of Indian Affairs near Window Park, Arizona.

That's the story, according to an impartial survey conducted recently by an independent research bureau.

In answering the question — *"Which make do you prefer?"* — 65.6 percent of the respondents expressed a preference for Bucyrus-Erie!

To the question — *"What three manufacturers first come to mind when you think of water well drills?"* — there were more than twice as many first mentions for Bucyrus-Erie than for all others combined.

Of those indicating ownership of both Bucyrus-Erie and other makes of drills, 73.7 percent expressed a preference for Bucyrus-Erie.

Investigate today the many reasons behind this 2 to 1 preference. Join the thousands of satisfied owners who count on Bucyrus-Eries to deliver top profits year after year. Visit your nearby distributor for data or write us direct.

114W58C

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1-W 20-W 22-W 60-L 28-L

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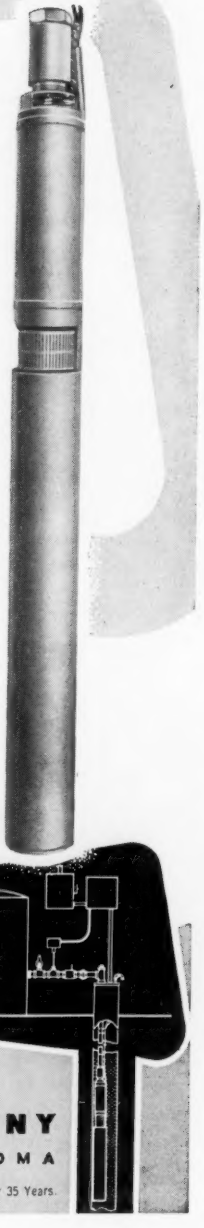

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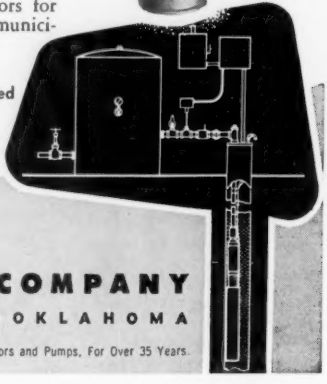

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Worlds Largest Manufacturer of Submergible Electric Motors and Pumps, For Over 35 Years.

The Driller

South Milwaukee, Wisconsin

Vol. 32 No. 3

March 1958

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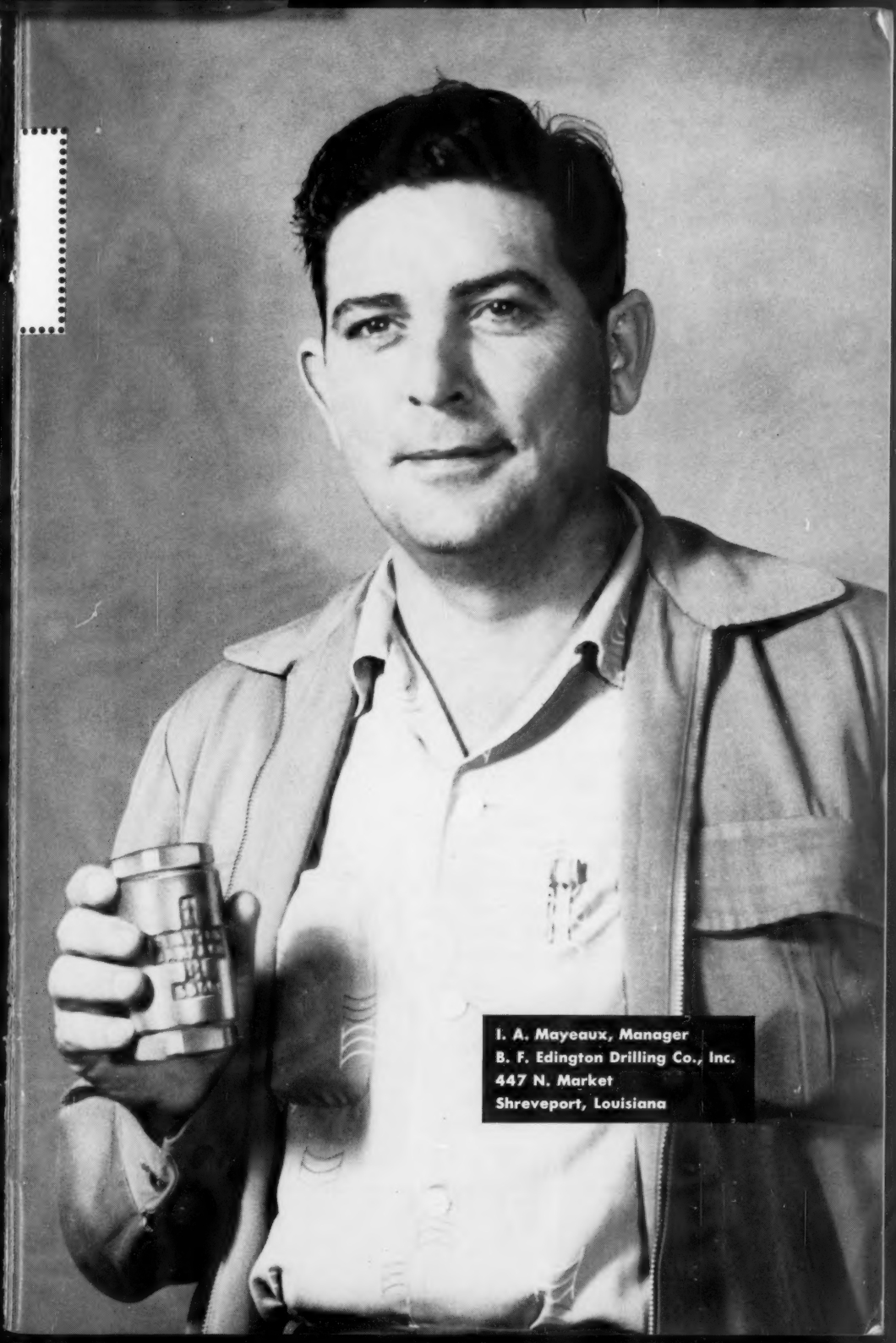

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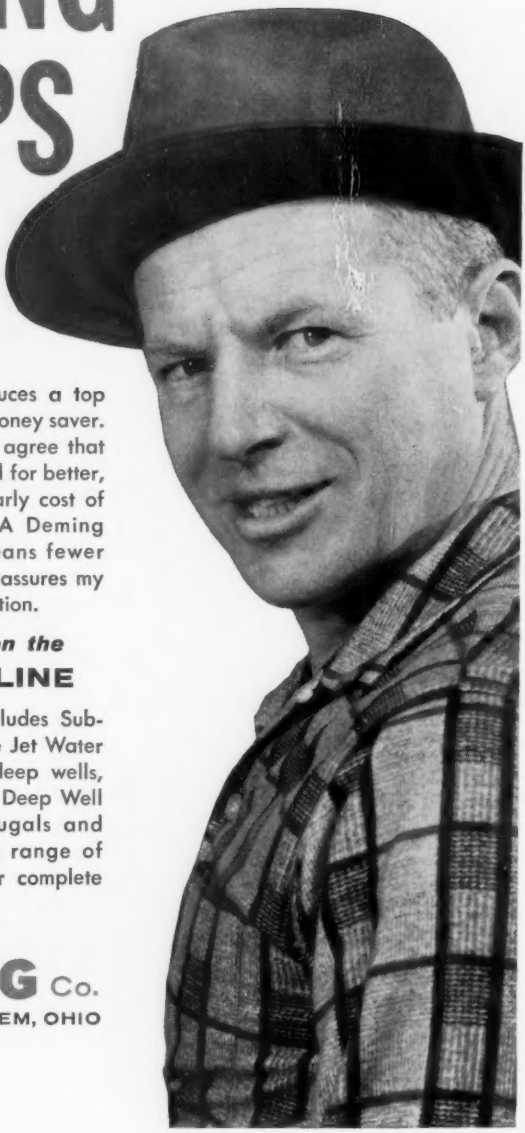

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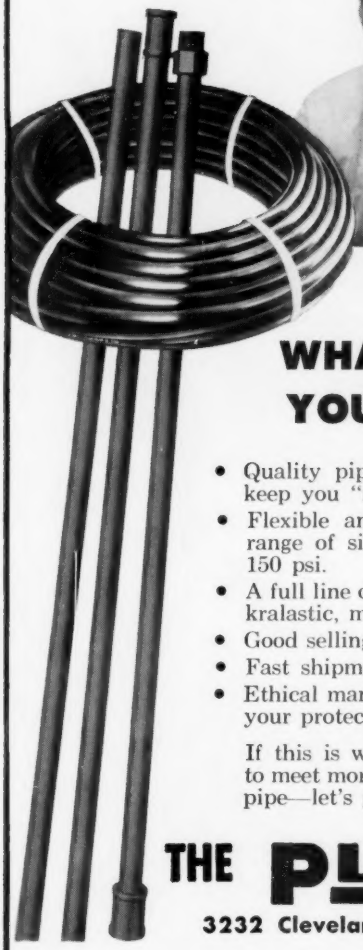

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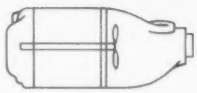

Pump impeller fastens to motor shaft, eliminating stub shaft, couplings and outboard bearings. Fewer parts, less assembly labor.

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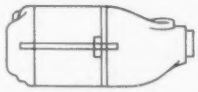
Seal cavity in end-casting enables mounting of pump without adapter casting. Reduces labor cost and parts inventory.

S/S MOTOR SHAFT IS RUSTPROOF



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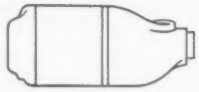

Integrated pump and motor save space and weight. Franklineering improves product appearance and performance, and cuts costs.

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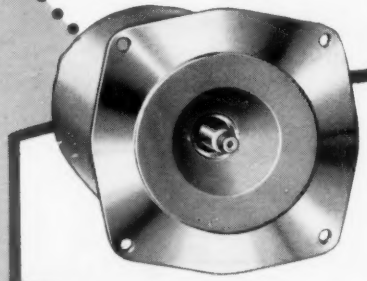

Franklineering...

describes Franklin Electric Company's advanced methods employed in design and production of application-engineered motors. Manufacturers who incorporate these motors with their products enjoy cost advantages in addition to superior performance. In the competitive water system market, leading manufacturers prefer dependable Franklineered Motors to provide product reliability.

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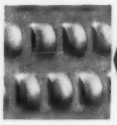

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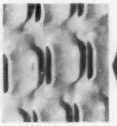

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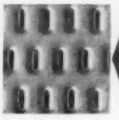
Water enters from opposite sides of perforations. ½″ to 1″ long, 1/16″ to ¼″ wide.



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PLAIN END
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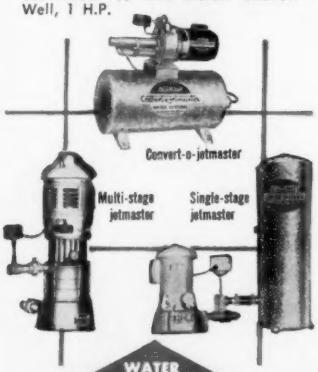

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He will fill you in on the many selling helps you'll get from Fairbanks-Morse: national advertising; local co-op advertising; point-of-purchase materials; envelope stuffers and other mailers; TV and movie trailers; radio scripts, and—most important—the really profitable discount plan.

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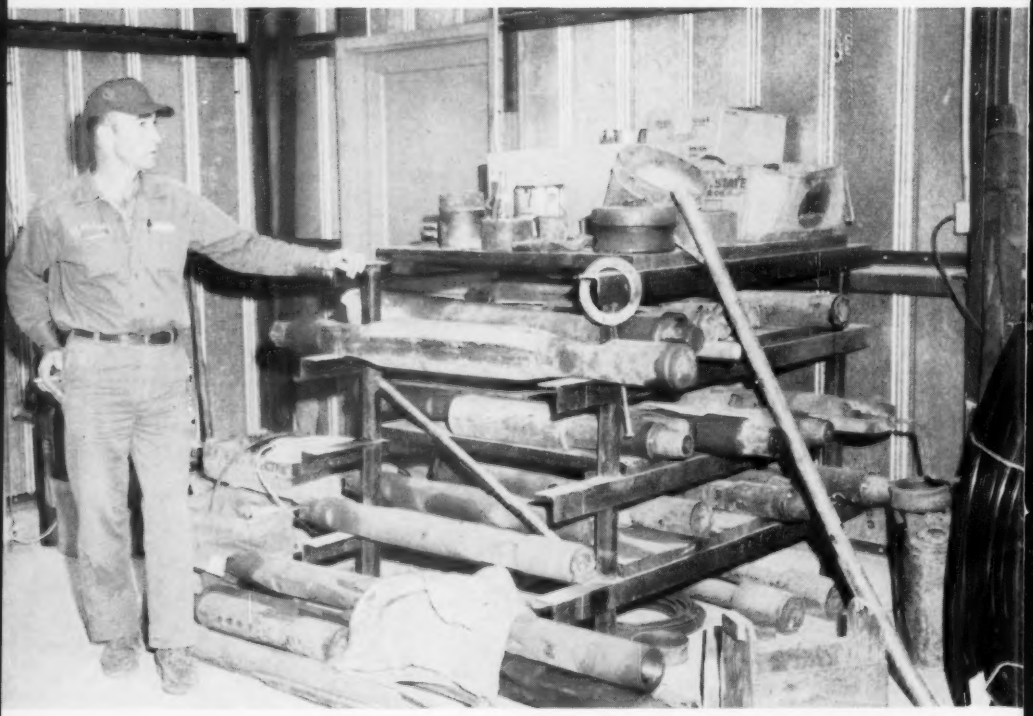
Maintenance-Minded Ted

The concerted effort this Verbank (N.Y.) driller makes to keep his equipment in excellent condition pays off handsomely in the form of maximum output and longer life for all his machines.

THEODORE (Ted) J. Philipbar operates a thriving water well drilling business out of Verbank, located in New York state's Hudson Valley region. He recognizes the importance of keeping his equipment in A-1 shape. A visitor to any of the jobs on which the 36-year-old Philipbar's drills are working will be impressed by their clean, top-notch condition.

Ted explains the firm's philosophy on proper maintenance of all its

Ted poses next to the handy rack he built for neat storage of drilling tools.



Four signs, similar to the above, advertise the firm to well prospects in area.

equipment: "If we expect to get the best possible service out of our equipment, we naturally have to give it the best maintenance and care. In addition to lubricating everything at proper intervals, we steam-clean the drills when they need it and try to paint them at least once a year. We generally close down for the entire month of February. This gives the men well-deserved vacation time and gives us an opportunity to take care of the painting and other repair work that can't be handled very well when the business is operating full swing."

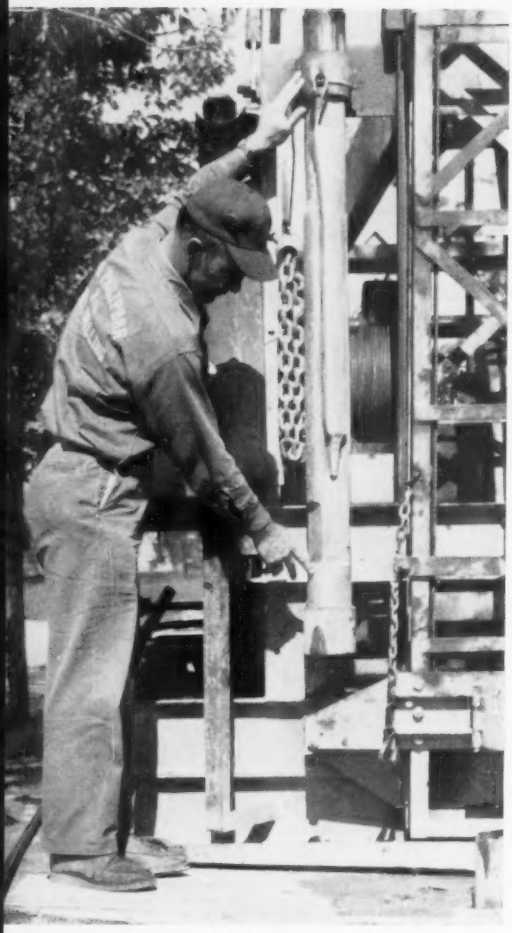
The maintenance work is carried on in a 24 x 40-ft. Butler steel building and a 26 x 50-ft. cinder block structure which are located at Ted's home on the outskirts of Verbank. In the center of the steel building is an electric hoist which enables a single man to lift tools, etc. by himself. All necessary tools for on-the-spot minor repairs are also kept with each of the drills.

Business Started in 1946

The business, which now keeps four drills operating constantly, was started by Ted Philipbar upon his release from the Marine Corps in 1946. He had several years' experience as a driller and helper before entering the Marines in 1942. The first rig he owned after starting his own business was a new Keystone 50. Within two years, the business was able to boast of three drills working full time. His brother, John, who started working for him as a driller six months after the business was started, is now vice-president and supervisor in charge of operations for the firm. Ted is kept busy contacting customers, bidding on new jobs, keeping the books up-to-date, etc.

Today, the firm's drill roster is 100% Bucyrus-Erie. The four drills owned include: a 60-L, which was purchased new in 1956; a 24-L, which was bought new in 1949; and two 22-Ws, one of them of 1955 vintage, the other a 1954 model. The drills are all truck-mounted. The 60-L is mounted on a 1952 International, the 24-L on a 1946 Reo, and the two 22-Ws are set on a 1948 Mack and a 1948 International.

Each of the four Ford pickup trucks owned has two 50-gal. water drums mounted in back. The drums are filled each morning before the drillers start out for their respective job sites with the pickups. A 1953, 1½-ton, Ford F-5 platform truck is used for hauling casing, tools, etc. to job sites. It is equipped with a 10-ton winch, which comes in handy for rescuing the drills or other trucks when they become stuck in muddy locations and



Braces welded onto drill frame keep jars handy but out of way when not used.

are unable to get out under their own power. Other equipment includes a Smith electric welder, an Ingersoll-Rand air compressor and a Malsbury steam cleaner, which is used for steam-cleaning the rigs from time to time.

Good equipment, its proper care and maintenance and the exercise of sound business judgment are essential to the success of any drilling business, but they are of little value if the drills are operated by inexperienced or incompetent drillers. The Philipbars have little cause for worry on this score, however. Both Ted and John heartily agree that they are fortunate in having the best crew of drillers available anywhere.

"One reason for this," claims Ted, "is the fact that we break in most of our men ourselves. In this way, we can select the helpers whom we feel have the greatest potential for becoming top-notch drillers and train them from the ground up. We don't worry about having to help them 'unlearn' any bad habits, because they don't have the opportunity to form any."

Employees on the Philipbar payroll receive, in addition to their regular wages, Blue Shield & Blue Cross insurance and a month vacation each year. They are also provided with work uniforms, so they can always put in a good on-the-job appearance.

Mobile phones, which Ted and John have installed in their automobiles, have helped them solve the problem of maintaining adequate liaison between themselves and their drillers very nicely. A driller who happens to be having trouble on a particular job or wants to receive work instructions can go to the nearest telephone and dial the mobile system's code number. A short blast on the horn of the automobile in which the receiver is located then sounds, indicating that a call is being placed. The mobile phones have an operating radius of 50 miles.

About 75% of the wells drilled by the Philipbars are for farm or home use; the other 25% are municipal, industrial and miscellaneous type wells.

At the time of The Driller's visit, the 60-L was being set up to begin work on a 6-in. home well near Fishkill, N.Y. The well was expected to bottom at 350 feet.

Ted states that around 90% of the large development wells put down in their area are drilled by their firm.

The greatest flow obtained from a Philipbar well was 800 gpm, with a 6-ft. drawdown. It was a 50-ft. deep well they drilled with their 60-L for the town of Dover Plains, N.Y., in July of 1957. The well, which was set with a 10-in. screen, required five days to complete.

The deepest well completed to date by the firm was a 750-ft. deep, 8-in. well for a large housing development in Red Hook, N.Y. Drilled through hard limestone all the way with the 60-L, the well was finished in three weeks.

Takes On Well Repair Work

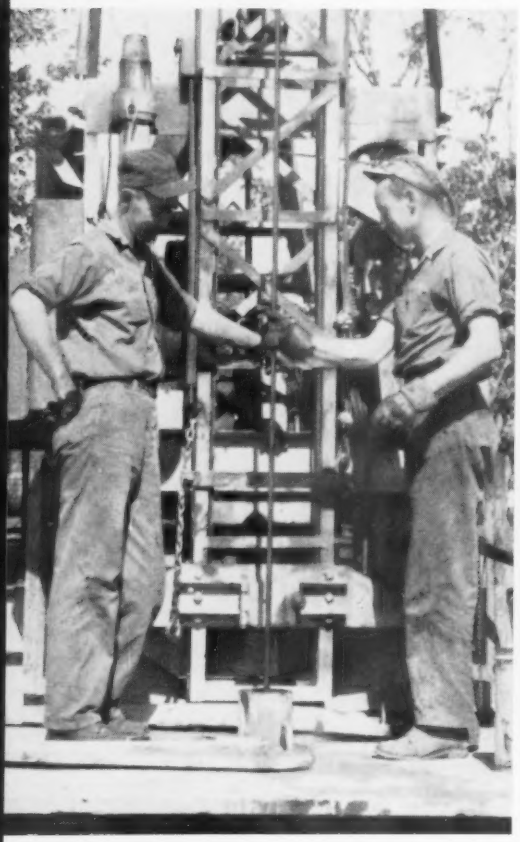
In addition to the contracting for new well jobs, a large amount of well repair work is also taken on by the firm. The percentage of jobs of this sort has been especially high during the past year, primarily due to the extreme drought conditions that existed throughout the area last summer. Water tables dropped to unprecedented lows, with so many wells going dry or producing decreased amounts of water that the Philipbars, like other drilling contractors in the area, were swamped with more requests for well repair and deepening jobs than they could possibly handle.

When visited by *The Driller,* one of the 22-Ws was down 30 feet in a shale formation on a 6-in. farm well near Stanfordville, which is located several miles from Verbank. Driller Don Daley, who was at the controls of the machine, expected the well to bottom at 175 to 200 feet. The other 22-W, with driller Art Eighmie at the controls, was working on a 6-in. well for a home near Verbank. This well was expected to bottom at around 200 feet.

The 60-L was just getting started on a 6-in. home well near Fishkill, N.Y. The Philipbars estimated that this well, which would be drilled through hard limestone and granite

formations, would bottom at around 350 feet and would require anywhere from ten days to two weeks for completion.

Driller Frank Cross was at the controls of the 60-L. Literally born into the drilling business, the 58-yr. old Cross has drilled wells in seven states for a period of more than 40 years. His father was one of the first drillers in New York state. Cross, who has been with Philipbar for the last four years, noted some of the changes he has seen take place in the drilling industry: "The biggest improvement I've seen in water well drilling was the change in drills from manila to wire rope. The development of the swivel socket gave the industry a real shot in the arm, too."



John Philipbar (L) lends a helping hand to driller Roy Ruehle on well he is drilling with firm's Bucyrus-Erie 24-L.

The 24-L was being used to deepen a 120-ft. farm well that had been drilled several years ago but had gone dry during the current drought. Driller Roy Ruehle, who was operating the 24-L, expected that, by drilling the well about 70 or 80 feet deeper through the limestone formation, a good supply of water could again be realized.

Both John and Ted are vehemently opposed to any form of price-cutting. They recognize the fact that, when lower prices are charged by any drilling contractor to win customers away from his competitors, a corresponding reduction in the quality of the finished well must also take place. Therefore, the Philipbars always charge their customers what is necessary to complete a quality well.

Ground formations vary a great deal in the hilly countryside surrounding Verbank. Generally, however, the drill tools will hit shale at depths of from five to fifty feet and continue through that formation until a good water supply is reached.

Detailed maps are kept of areas in which unusual conditions have been encountered so that when work is again contracted for in a certain area, a prediction can be made of the difficulties which are likely to occur. With knowledge of this sort, steps can often be taken to prevent the trouble from ever arising.

Average footage per day for each of the drills will always vary consider-

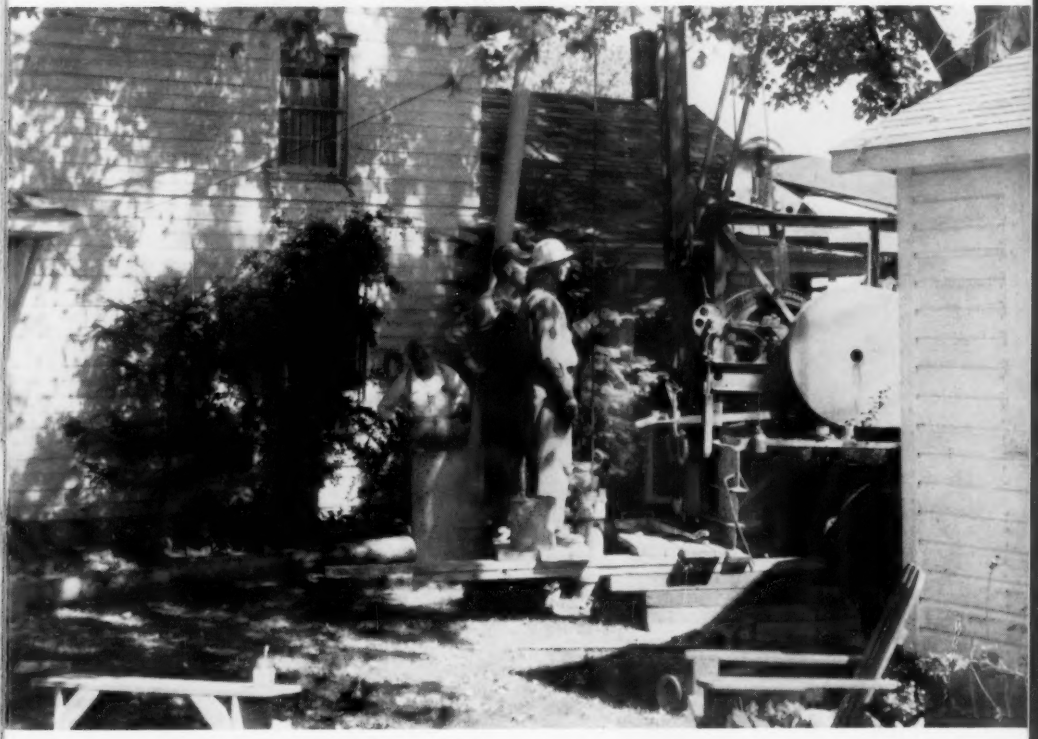
ably, depending on ground formations and conditions peculiar to the particular area in which they happen to be working. According to Ted, average footage could run anywhere from 25 to 50 feet per day.

During one period of peak productivity, 325 wells were put down with the firm's four rigs in a year. This was an unusually high average, however, stemming from the fact that a high percentage of the wells were drilled for a large housing development.

While the Philipbars have had their share of fishing problems, they feel that, through the exercise of extra care by experienced drillers, problems of this sort have been kept to an absolute minimum. A careful check of all tool joints at periodic intervals has considerably lessened the likelihood of tools being lost because they were loose or improperly joined together.

To help bring in new business, and to keep its name before its old customers, the firm has placed four large (20 feet wide x 8 feet deep) billboards at strategic locations in its territory. This has been found to be the only form of advertising necessary to keep the business operating at full swing. And judging from the way things have been going, it will be operating that way for a long time.

Ted stops in to check progress driller Art Eighmie is making with 22-W on 6-in. home well near Verbank. Eighmie expected the well to bottom at 200-ft. depth.



*Geological of Water Well

EVERY well driller should have at least a working knowledge of the geological aspects of water well drilling to the extent that they affect the origin of water, where it goes, and how it is brought up out of the ground. He should be familiar with the systematic movement of all the waters of the earth, a phenomenon which has come to be called the *water cycle.*

The water cycle is a means for locating all water in existence. It explains the constant movement that waters of the earth are undergoing, and shows how and why quantities of water in various phases of the cycle change from time to time. Moisture in the air, for instance, is subject to winds, temperature changes, etc. which cause evaporation, transpiration, and precipitation. Water in the oceans is subject to temperature differences, the movement of the earth around the sun and moon, and the movement of air above the surface. Of all water falling on land in the form of rain, snow, sleet, or other precipitation, one part runs off the earth's surface as streams or rivers; another portion returns to the atmosphere through evaporation and transpiration. Another quantity —an estimated 30 to 50%—is absorbed by the earth, seeping down through porous formations near the surface to collect for a time in what is termed the *zone of saturation* before eventually finding its way to the

*Article based on material taken from "Water Well Drilling with Cable Tools"—by Bucyrus-Erie representative Raymond W. Gordon.

Aspects Drilling

sea by gravity. Naturally, water falling upon rocky, mountainous areas will not be absorbed as readily as upon sandy, open regions.

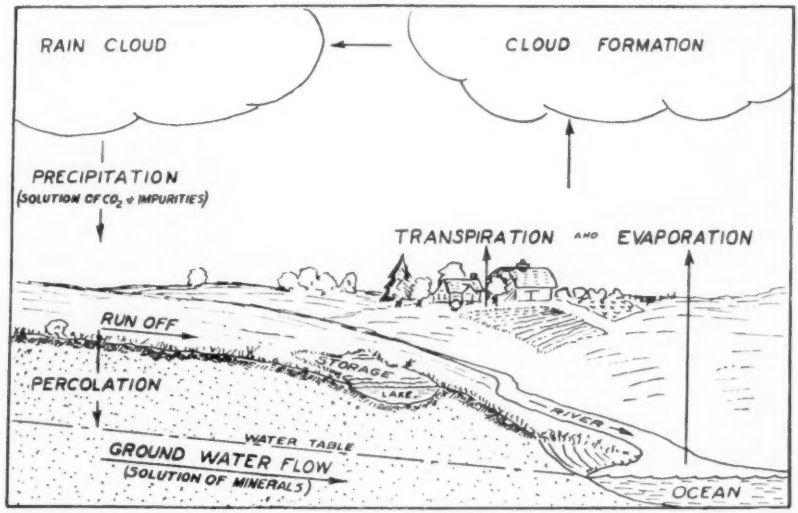
Classifications of Water

All water can be classified as atmospheric, surface, or subsurface water. Two of these are of interest to us here—atmospheric and subsurface water.

1. Atmospheric Water. Atmospheric water may be solid, liquid, or vapor. Vaporization takes place at temperatures of 212°F or higher, but water can also "evaporate" at temperatures below the boiling point, the degree of vaporization depending upon prevailing air pressures as well as temperatures. In warm climates, evaporation is a common occurrence, giving validity to the term, "steaming tropics." We have all seen evaporation from land surfaces after a light, warm rainfall. The amount of seepage or percolation is affected by vaporization and evaporation, while the percentage of total precipitation going to stream run-off, transpiration, or seepage depends upon factors of soil surface such as dryness, water already in the soil, topography of the surface, etc.

2. Subsurface Water. Our interest as drillers is confined to waters of external or atmospheric origin, or (Fig. 2) what is known as interstitial water. Here we observe two further divi-

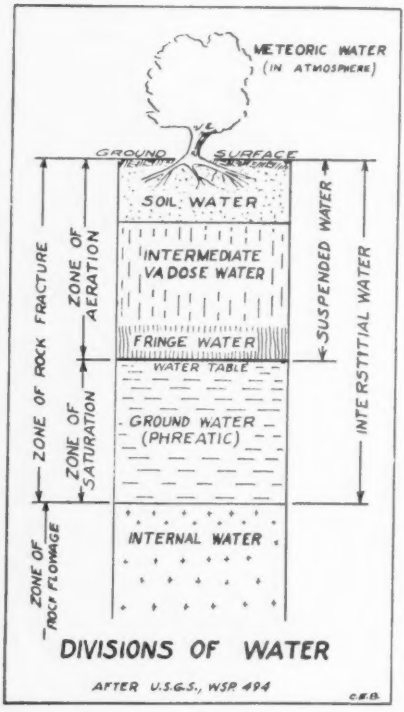
Fig. 1 — The hydrological cycle



sions: (a) the zone of aeration, also called the zone of suspended water, and (b) the zone of saturation. Water passing through the zone of aeration collects in the zone of saturation. When we drill a well we must reach this zone of saturation. In some localities the zone of aeration holds large quantities of water. Such storage may be only temporary because water is drawn downward into the zone of saturation either by molecular attraction or by gravity.

Sometimes water is trapped within the zone of aeration by surrounding beds of clay. This "perched water" (Fig. 3) as it is called is always higher than the real ground water table. A driller should avoid finishing his well in perched bodies of water.

Fig. 2 — Divisions of water



The zone of saturation forms a huge, extensive system of connected natural reservoirs extending from a few feet to several hundreds of feet in depth, depending upon the existing formation. From these reservoirs, wells, springs, and some streams derive their water. This water may be found in deep beds, in several separate layers, or in *veins.*

Because water can fill any kind of an opening, the term *ground water* applies to bedrock formations as well as to loose, unconsolidated formations. Water found in sandstone and limestone rock is just as much ground water as that found in sand and gravel deposits. Generally, water from bedrock formations is found in the upper portion only — above the 2,000-ft. levels — because at greater depths most bedrocks become so dense and solid that water cannot penetrate them. Porous rocks have been found at depths as great as 6,000 feet, however, and we know of one water well which was drilled to a depth of over 8,000 feet.

Classifications of Rocks

Geologists also classify rocks in three major groups apart from their age: (1) *igneous rocks,* or those which have cooled and solidified from a molten mass; (2) *sedimentary rocks,* or those which have been deposited by water, wind, or chemical action and later consolidated; and (3) *metamorphic rocks,* or those of either of the first two groups which have been altered by heat, pressure, solutions, or other means.

1. Igneous Rocks. These include such types as granite, dioxite, gabbro

and syenite, which are relatively coarse in texture and the finer-grained types such as basalt and rhyolite. The coarse-grained rocks cooled at great depths under the earth's surface; the fine grained rocks, such as lava, cooled at or near the surface. Water is found in the joints or fractures of granite, and occasionally in the upper weathered zone, which is sometimes referred to as decomposed granite. Generally, only a relatively small amount of water can be obtained from wells drilled in such rocks. Some lava flows of igneous rocks are quite porous, and wells drilled in these porous zones may yield considerable volumes of water.

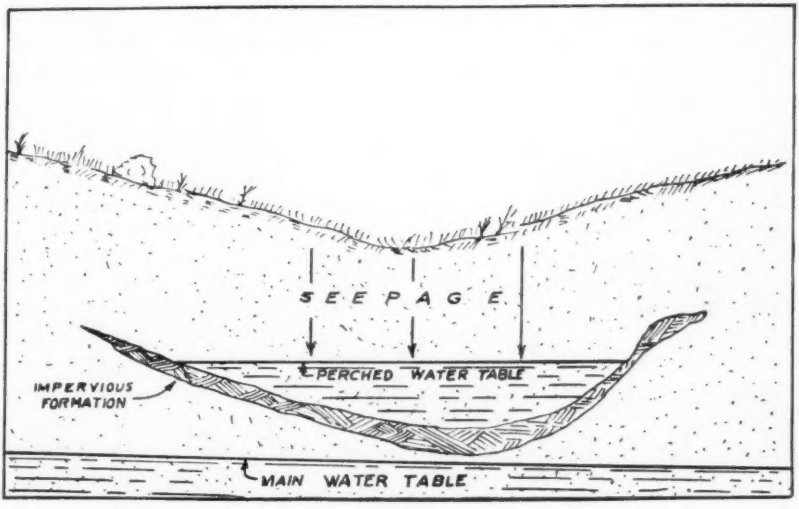
2. Sedimentary Rocks. These include shale, sandstone, limestone, dolomite, conglomerate, etc. These rocks are the result of the consolidation of loose sediments. By the interplay of natural forces, clay became shale, sand became sandstone, lime became limestone, etc. When sediments had become consolidated into their respective rocks, the occurrence of water was about the same as in the original unconsolidated sediments but, due to compaction and cementation, the porosity of the rock became somewhat less.

3. Metamorphic Rocks. These include quartzite, marble, schist, slate, etc. They have resulted from the long action of heat, pressure, and chemical solutions upon igneous and sedimentary rocks. Generally, rocks of this class are poor water producers because of their denseness. What little water they do hold is found in the cracks and joints. Marble, because it is metamorphised limestone, may contain larger solution openings and, therefore, be a better water producer than some of the other metamorphic rocks.

To determine their relative merits, let's take a look at the various water-bearing formations a driller may en-

(Continued on page 58)

Fig. 3 — Perched water



Acidizing Water Wells To Increase Volume

by Earl Baker, Jr.

E. C. Baker & Sons
Sigel, Ill.

ACID treatment of wells is often considered primarily a means for removing incrustations from screens or casings. It is also an effective means for opening the pores in limestone and other similar formations to increase water flow into a well.

Since we are speaking in the terms of general conditions, we would have to assume that limestone in its pure state is calcareous, to a varied degree, of course, and that it will react, sometimes violently, when acid is applied to it. Limestone in its solid form cannot be classified as an aquifer unless it contains cracks or crevices, which, when connected to a source of supply, will produce water. It is not unusual for water found in limestone to have a fairly high calcium content. When mixed with other minerals in certain proportions, this will produce calcium carbonate, or a substance very similar to the incrustation that forms on screens in a sand and gravel formation.

We have used acid quite often in the development of new wells and have found it to be much more satisfactory than shooting a well, the reason being that with acid you can exercise more control on the operation than you can by shooting. Our normal procedure in acidizing is to save drill cuttings from the hole and wash them clean with water. After placing a small general sample of the cuttings in a graduated glass or vial, we place a small amount of acid (normally, 15% inhibited hydrochloric acid) in the glass and see how it reacts. If it were pure limestone and enough acid were applied, it would dissolve all of the limestone. We work on the theory that, by enlarging the cracks and channels near the well which run into larger ones nearby, we can eliminate any obstructions that may be restricting the water from entering the well. This results in increased production, brought about by lessened resistance of the formation.

Let us assume that a water well with a capacity of ½ gpm (initial production) has been going along for a couple of years and you discover one day that it is only producing half as much as it did originally. After it has been idle for a time sufficient for it to reach its static water level, you measure the water table. This should be compared with the original static water level. In this way you very quickly can tell if your trouble is due to an obstruction in the well or to a depleting water condition. Should the latter condition be present, it would

be useless to attempt acidizing; instead, you may as well look for another water supply. If the trouble is due to an obstruction, acid should restore production to what it was originally. However, do not expect an immediate increase over the original capacity because of the slow rate of induction of the acid into the formation and the time element involved. The acid has a maximum time that it takes to spend itself once it comes in contact with the limestone. On low producing wells, we apply several smaller treatments rather than one large one.

The formula we use consists of a quantity of inhibited hydrochloric acid, 15% strength, equal to three times the volume of the hole per foot of formation to be acidized. Example: A 6-in. hole will have a volume of 1½ gallons per foot, or 4½ gallons of acid per foot of formation. The purpose of the inhibitor is to keep the acid from attacking the metal parts of the well, and to enable us to haul the acid to the job in steel drums. The inhibitor must be non-toxic. When we first started acidizing, we could only find one inhibitor that was non-toxic for water wells. Now there are several on the market. To every 50 gallons of acid we use 12 ounces of Rochelle salts and 1½ pints of lactic acid. These two ingredients used to be quite a problem to obtain, and every time we acidized a well we would have to clean out every drug store for 50 miles around to get enough to do the job. The purpose of these ingredients is to keep the clay and oxidized iron that might be present in the formation from precipitating and causing the pores and channels to become clogged. Our greatest increase in ca-

(Continued on page 55)

It Pays to Install a

JENSEN WATER SYSTEM

Pump Handle Pete says: *"After settin' on that jury I'd say that woman always pays — unless of course, she has a father, a husband or a good lawyer."*

Speaking of paying — we know thousands of folks (including drillers) who will tell you JENSEN AUTOMATIC WATER SYSTEMS pay too!

You bet they pay, in a hundred different ways. Plenty of water for kitchen and bath. Better fire protection. Better production for poultry and livestock. No shutdown of plant or factory for lack of water.

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Model 50-DC, one of 14 sizes

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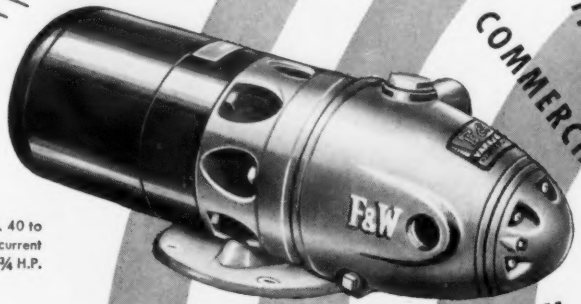
Performance-Proved Since 1866



F & W VARIJET Shallow Well. 40 to 70% more water, yet cuts current used. 720-1800 G.P.H. ¼ to ¾ H.P.

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Yes! You're right on target in every way that means profit from water systems with F & W! There's a *complete* line—with a pump for every capacity, pressure, and type of service for home or farm. F & W gives you exclusive advantages that help you sell . . . and F & W Systems *do* give trouble-free performance; that means satisfied customers. Take the F & W VARIJET for instance. It is absolutely unapproached by any other pump for shallow-well use. It gives 40 to 70% more water yet reduces motor load and power consumption. Do customers like it? You bet they do! And it's an *exclusive* F & W patent! So it is with other F & W Pumps. You enjoy comparable advantages that make F & W the proved, dependable, profit-line for you! So why not put F & W to work for you, too? Send today for our complete catalog.

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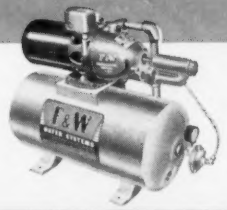
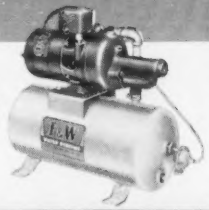


F & W Multi-Purpose Jet. Easily changed to deep-well use. ½, ¾ & 1 H.P., 1 and 2 stages. Pressures to 100 lbs. Maximum capacity 950 G.P.H.



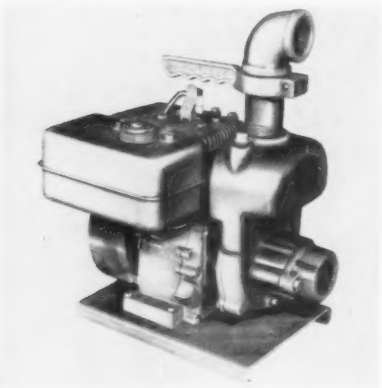
F & W "Economy" Multi-Purpose Jet. ½ H.P. 350 G.P.H. Easily changed to deep well operation.

F & W Deep Well Multi-Stage Jet. 1 to 4-Stage, ⅓ to 5 H.P. (500-4000 G.P.H.). Control Valve, Speedi-change Seal, Air Injector.

F&W means Flowing Water by Flint & Walling

News of the month

Berkeley Announces New Line of Self-Priming Pumps



The Berkeley Pump Co. offers nine new models in its line of self-priming centrifugal pumps. Ranging in capacity from 4,000 gph to 40,000 gph, the new pumps are available in 1½-in. through 4-in. discharge sizes and can be purchased with steel rail base, skid base, or can be obtained on a trailer mount.

Performance data and prices are available by writing Berkeley Pump Co., Dept. TD, P.O. Box 7, Station A, Berkeley, Calif.

Empire State Well Drillers Hold Meeting Jan. 15

The annual meeting and banquet of the Empire State Water Well Drillers' Assn. was held at Trinkaus Manor in Oriskany, N.Y., on Jan. 15.

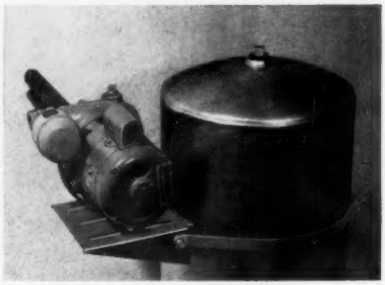
Officers elected to head the association for the coming year are: Lee Bates, Rome, N.Y., president; Clayton Scheffer, Stafford, N.Y., vice-president; Robert E. Klindt, Morris, N.Y., secretary-treasurer; Ted Hall, Clyde, N.Y., director; and Leon Swan, Port Crane, N.Y., director.

A. Y. McDonald Mfg. Co. Cites Outstanding Representatives

At the conclusion of the annual sales meeting of jobber salesmen of the A. Y. McDonald Mfg. Co., Dubuque, Iowa, O. V. Gibbons was presented a special award naming him outstanding district manager of the year. Mr. Gibbons has been associated with the company for 20 years.

A special award also was presented to A. G. Dyson, honoring him as outstanding salesman of the year. Mr. Dyson has been connected with the company since 1954.

New-Type Pump Mount Improves Tank-Pump Installation



A new way to mount pumps on residential water-tank pump systems is being introduced by the Earl C. Wayland Co. of Strongsville, Ohio. The Wayland Pump Mount fits all

standard 16 and 20-in. diameter vertical tanks and most water pumps. It fits compactly alongside the tank, bracketed to the tank for vibration-free and noiseless operation. It saves floor space and can be adjusted to fit any position and space.

The new Wayland Mount of galvanized steel comes complete with fittings and can be installed quickly. It eliminates makeshift pump bases or blocks and does away with a separate standpipe to prime the pump.

For complete information concerning the pump mount, write to Earl C. Wayland Co., Dept. TD, Strongsville, Ohio.

DuPont, Yardley Announce Plastic Pipe Contest

The DuPont Co., producer of Alathon 25 polyethylene resin for flexible plastic pipe, and Yardley Plastics Co. of Columbus, largest user of the resin, announce a new nation-wide contest for retail dealers who handle plastic pipe.

It is a contest to name a new little

(Continued on page 58)

"I'm afraid your talents are just a bit too specialized for this driller job."

WELL-MADE TANK SPUDS WON'T WORK LOOSE *EVER!*

WELL-MADE *HEAD* SPUDS are embossed in the head during fabrication . . . The *SHELL* SPUDS are formed to the tank's contour and completely submerged arc welded.

Compare these
WELL-MADE FEATURES

- **RIGID WELD SHELL SPUDS**—Won't work loose.
- **EXTRUDED HEAD SPUDS**—Protect against leakers.
- **HEAD & BOTTOM OFFSET**—Inserted under pressure, locked in, submerged arc welded.
- **PRESSURE GAUGE TAPPING**—for easy—speedy—inexpensive hook-up.
- **MID-POINT AIR VOLUME CONTROL TAPPING**—for more water—fewer pump starts.
- **1⅛" REINFORCED SAFETY BAND**—Protection against corrosion.
- **"HI-SPEC" GALVANIZED INSIDE & OUTSIDE**—Insures maximum zinc thickness.
- **MANUFACTURED IN UNIVERSAL SERIES**—Adaptable for all installations.
- **UNCONDITIONALLY GUARANTEED**

ALWAYS LOOK FOR THE WELL-MADE SAFETY BAND

See your dealer or write
Metal Coating Corporation
1215 West 37th Street
Chicago 9, Illinois

from the MAILBAG

This page is open to any of our readers having questions to ask relating to drilling, driving pipe, dressing bits, etc. All letters will be answered promptly by experienced drillers and engineers, who are qualified to give intelligent advice on these subjects. We will publish as many letters of general interest as space will permit. Address: The Driller, South Milwaukee, Wis.

Gasoline Taste In Well Water

Dear Sir:

I had an artesian well, drilled 132 feet deep, and have been using the water for about two months.

The water has a definite odor and tastes of gasoline. So I tried sterilizing the well with chlorine, but to no avail. I had the water tested and was told the foreign element is gasoline.

There isn't any garage or gasoline station nearby.

I would appreciate it very much if you could suggest what may be wrong.

M.G. New York

Although you indicate in your letter that there is no garage or gasoline station near the well, which might be the source of gasoline getting into the water — sometimes, if the well is in limestone — the gasoline might descend to cracks and crevices of various sorts to a considerable depth and thus enter the ground water.

There is a possibility, too, that the water may have come in contact with natural gas, which seeps out from the underlying shale and is imprisoned in the sand by the overlying clay. This condition is not uncommon where shale is overlaid by sand and clay.

Another possibility for the gas odor in the water may be that the well is cased with pipe that has been used in connection with a gasoline or natural gas supply, so that this odor may be coming from that source.

Some benefit may be found by adding a strong solution of soapy water and scrubbing the casing thoroughly on several occasions over a period of three or four days. After pumping the well for several hours to remove the soapy water, the well may yield a more potable water.

Cement Grout to Shut Off Sulphur Water

Dear Sir:

Would you please tell me what portion of cement, sand and rock to use in sulphur water to shut out the bottom level from the fresh water level on top? The distance between the two water levels is about 35 feet.

W.N.R. Tennessee

Unfortunately, you did not state the diameter of the hole and the size of the casing. It may be possible to shut off the sulphur water by sealing the casing by cementing if there is sufficient annular space between the casing and the diameter of hole.

Proper preparation of the cement grout mixture is of importance. The best results are obtained through the use of cement and water in the ratio of one bag (cu. ft.) of fresh cement, free from lumps, to 4½ to five gallons of clean water, or if necessary, up to five gallons are permissible. It is important that the grout material be placed in one continuous mass from the bottom of the annular space to be grouted upward.

The casing or pipe should be pulled back about two feet from the bottom and cement poured inside the liner

from the top. A mixture of clay and mud should be poured on top of the cement to force it down the inside of the casing and up around the outside to completely fill the annular space.

If the cement is set, the clay mud mixture may be bailed out and any plug remaining in the bottom of the casing can be drilled out.

Has Trouble With Sand Entering Well Casing

Dear Sir:

I would like to have some information on how to prevent sand from coming up in the casing after a well has been completed. In some cases, it is a year or more before the sand rises and the pump brings up a certain amount of sand with the water. The water is found in this sand, which is like pepper or fine salt. What is the best way to keep this sand out of the casing?

Also, what are the best methods for drilling in loose gravel with cable tools? This gravel is ½ to 1½ inches in size. What kind of bit should be used or how should it be sharpened?

M.H. Oregon

Quite frequently, when wells are made in sand or gravel, it is necessary to place a screen in the bottom of the well in order to prevent the fine sand from rising in the pipe. If this sand continues to rise in the casing, it will result in cutting out the pump leathers and in time this may plug the well.

Wells are sometimes made in sand and gravel without the use of a screen or without perforating the pipe simply by packing gravel around the bottom of the pipe. To do this, the pipe is driven down into the sand or gravel to the point where the particles seem to be the coarsest and then the pipe is cleaned out.

Next, coarse gravel, about the size of hickory nuts, is poured into the well until the bottom of the pipe is filled for a distance of about two to three inches. Next, by lowering the drilling

(Continued on page 39)

JOIN THE "can't lose" Flexible Plastic Pipe Contest

you're sure to win customer satisfaction with **GUARANTEED RIGHT IN WRITING**

Cresline

FLEXIBLE PLASTIC PIPE

. . . you may also win one of 4 trucks . . . in addition to one of 100 other prizes in the DU PONT PLASTIC PIPE CONTEST!

Cresline is the *proved right* flexible plastic pipe. Proved right by grueling accelerated use tests. Checked for quality through every stage of production. Approved for drinking water use by the National Sanitation Foundation. Guaranteed *right in writing!* Because Cresline is made of Du Pont Alathon 25, the finest quality virgin polyethylene, those who handle Cresline are eligible to enter Du Pont's easy contest. Entry cards are attached to each coil of Cresline Flexible Plastic Pipe. Write today for literature and the name of your Cresline representative.

Investigate Cresline KL (Kralastic) . . .

the Superior Plastic Pipe for Extra-Rugged Use

Cresline KL pipe is made from 100% virgin Kralastic resin. The lightest of all semi-rigid or rigid plastic pipes, it is excellent for many home and industrial uses including drinking water service lines where working pressures permit. Because of its extra strength, it can be used in many applications instead of metal pipe at a savings of 50% to 75% on installation costs. Write for details.

Write for free authoritative booklet — **"How to Choose and Use Flexible Plastic Pipe"**

All Plastic Pipe Is Round, Black and Has a Hole in It . . . But There Is a Difference!

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Dept. D-8, 955 Diamond Ave., Evansville 7, Ind.

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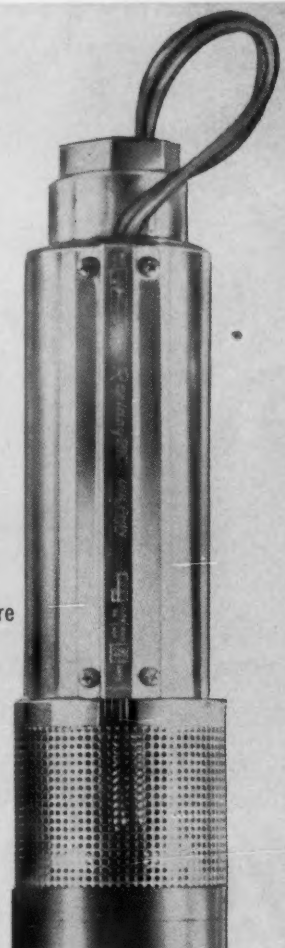
TWO WIRE **SUBMERSIBLE**

New ADVANCED SIMPLIFIED Design Eliminates Installation and Service Problems

Now, for the first time, there's a submersible pump for the BIG VOLUME market—a submersible that can meet the needs of all the domestic installations in your area—both shallow and deep wells, 4" or larger, 0 to 360 feet. It's the new Rapidayton 2-wire Dolphin* submersible with **advanced simplified** design which eliminates installation and service problems. Gone are water-tight splicing problems, since cable (60, 80, or 100 ft. long, depending on horsepower) is attached to pump at factory. Gone is the control box; you merely connect cable to simple overload protection box (furnished) at top of the well. For big volume, high profit, and easy installation, sell the new Rapidayton 2-wire Dolphin submersible.

YOU HAVE YOUR CHOICE!

3-wire Dolphin submersible models are also available from Rapidayton in three 4" series up to 3 h.p. for wells 0 to 500 ft.



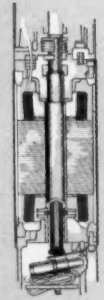
DOUBLE LIFE STAGE DESIGN

DOUBLE LIFE STAGE DESIGN

The Rapidayton 2-wire Dolphin submersibles have the same exclusive "Double Life" stage design as the 3-wire models now in dependable service from coast to coast. The "Double Life" design makes use of tough nylon for impellers. This construction, providing "loose" tolerances over first 20 days during which nylon is expanding to a predetermined limit, insures maximum protection against sand, higher efficiency, and longer life.

"PLUS POWER" MOTORS

The Tait-designed and made motor used in the 2-wire Dolphin submersibles is built for extremely high efficiency and "plus power." It operates just like a conventional capacitor-type jet motor. The mechanical starting switch (with special mercury cut-out) permits use of super size capacitor, assuring high-torque starts. Dielectric fluid-filled. Electronically tested. Motor parts vacuum impregnated with resin.



FOR WELLS 0 TO 360 FT.

The complete 2-wire line of Rapidayton submersibles includes 11 models, each available as pump only models or as complete systems with 42-gallon tanks which meet FHA requirements. They are: Deep-Setting models in ¼, ⅓, ½, ¾, 1 h.p.; Mid-Range in ⅓, ½, ¾, 1 h.p.; High Capacity in ¾, 1 h.p.

¼ h.p. pump only model retails for $169.50

Rapidayton division

The Tait Manufacturing Company, Dayton 1, Ohio

Established 1908 as The Dayton Pump and Manufacturing Co.

the driller and the LAW

Articles appearing under this heading are published for their general interest, and to remind readers that it is not safe to overlook the legal aspects of a water well drilling business. The articles are not intended to take the place of specific advice of counsel. For such advice, readers are urged to consult a local attorney.

Driller Had to Refund Advance Payments

An Alabama contractor agreed by oral contract to drill a well at $5.50 per foot and guaranteed that it would produce clear water fit for human consumption. The well was drilled in three stages and the owner made three advance payments according to the depth of each stage, totaling $935. The contractor hit water, but it was unclear, muddy, scummy and impotable. The water was not used for human consumption except in tests.

The owner asked the contractor to drill another well, which the latter agreed to do at half price—the owner to pay $300, plus cost of labor, gas and oil. The owner rejected the offer and sued for a refund. A jury awarded the owner $500, evidently concluding that the well was worth at least $435, even if the contract guaranty was not fulfilled.

On appeal, the Alabama Court of Appeals okayed judgment for that sum, Feb. 5, 1957. (Hurst v. Snider, 92 So. 2d 542.)

The Court of Appeals said:

"The 'guarantee' of water with an express warranty of suitability was the object of the undertaking; the payments were loans to be discharged upon successful performance.

"Failing to find fit water, the driller had not earned the progress payments and, upon abandonment of the well, owed the money back. The contract does not admit part performance any more than does an undertaking to paint a portrait." Here the court seems to intimate that, had the jury awarded repayment of the entire sum of $935, driller Hurst would not have had grounds on which he could base a legal complaint.

Two Very Important Legal Points

1. A contract to drill a well led to litigation largely because it called for production of water in volume "sufficient" for the owner's needs. Lesson: If production or minimum production is to be guaranteed by the well contractor, the volume should be specified.

2. By acts and silence, the owner may accept a well as complying with the contract, and thereby bar himself from afterwards denying that the driller has fulfilled the contract.

These two points were involved in a case decided by the Wisconsin Supreme Court, Oct. 8, 1957, Milaeger Well Drilling Co. v. Muskego Rendering Co., 85 2d 331.

The defendant's rendering plant had been destroyed by fire, resulting in contamination of its well by grease. The state board of health forbade further use of the well, and the defendant contracted with the plaintiff for a new well—apparently so near the old one as to indicate approximately

Here's Proof of 1-W Jetter Speed!

Check these actual time study reports on two different jobs handled by a 1-W jetter. The Bucyrus-Erie rig is owned by Elwood McGinnis & Sons, Absecon, N. J., and operated by Willwood S. McGinnis.

FRIDAY, November 9, 1956

10:30 a.m. — drill and pickup truck pulled out of McGinnis yard, traveled ¼-mile to new home site . . . rigged up 1-W promptly and drove 58 feet of 2-in. pipe . . . used ¾-in. drill rods to clean out inside 2-in. pipe by regular jetting method . . . the screen was installed in the conventional manner — dropping in screen and pulling casing, installed centrifugal test pump. Well tested at 20 gpm.

12 (Noon) — Job finished. Elapsed Time: *1½ hours.*

FRIDAY, May 24, 1957

2:30 p.m. — drill and pickup truck pulled out of yard, traveled 1½ miles to river boat dock . . . rigged up 1-W quickly and drove 102 feet of 2-in. pipe into formations consisting of 8 feet of meadow mud, 14 feet of fine sand, 20 feet of coarse sand, 30 feet of coarse sand and stone, 4 inches of tough iron ore, 30 feet of water sand . . . cleaned out with ¾-in. jetting tools . . . the screen was installed in the conventional manner—dropping in screen and pulling casing, installed test pump. Well tested 15 gpm.

4:30 p.m. — Job finished. Elapsed time: *2 hours.*

115W58C

For complete information on the speedy 1-W, see your nearby Bucyrus-Erie distributor now.

BUCYRUS ERIE

FIRST with the FINEST in Water Well Drills

the depth at which water would be found in the new well.

The contract was in the form of the plaintiff's letter, the terms of which were accepted by the defendant's written reply. The price was $10 per foot, including drilling, 8-in. pipe, shoe and 5-hr. test.

The plaintiff contractor agreed: "The well will be started by driving 8-in. pipe to the water-bearing gravel formation which will be encountered at about 190 feet. When the casing has penetrated this formation, we will perform a bailer test free of charge. If it is found that sufficient water can be had, we will make a test with a 6-in. cylinder and our well machine. This will be a 5-hr. test.

"In the event that gravel will not produce sufficient water, we will continue the 8-in. pipe and 8-in. hole until sufficient water is obtained."

Plaintiff Receives Partial Payment

The well was drilled 202 feet and tested by the plaintiff. The plaintiff removed his equipment from the defendant's premises and submitted a bill for $2,205.10, computed according to the agreement. About three weeks later, the defendant sent a check for $1,054.75 to which was attached a voucher stating that the payment included $1,000 "on account, for drilling of well". Later, the defendant refused to pay anything more until the plaintiff should so deepen the well as to provide more water. Still later, the defendant paid $250 on account under agreement that the plaintiff drill deeper. This was done to the 264-ft. level, for which the plaintiff billed the defendant $389 extra. The defendant refused to pay anything more on the ground that no more water was found than at the 202-ft. level and that it was cloudy and muddy.

The plaintiff sued to collect according to its billing. The Civil Court, Milwaukee County, awarded the plaintiff judgment for the full amount, and the defendant company appealed to the Supreme Court, which approved the award on the basis of the fact that the defendant had waived his right to claim that the plaintiff had failed to produce a well having the capacity required by the contract.

At the trial, the defendant's attorney contended that the provision in the contract for producing "sufficient water" was uncertain in meaning, and he attempted to prove that it was *orally* agreed between representatives of the parties when the contract was negotiated that "sufficient water" meant at least 50 gpm of usable water. Admittedly, the flow was 20 to 30 gpm. The trial judge excluded this proof on the grounds that it would contradict the terms of the written agreement. (There is a general rule of law to the effect that, in the absence of fraud or mistake, neither party can show a contradictory oral agreement. For example, if this contract had called for a well producing at least 30 gpm, the defendant could not have proved an oral agreement that the well must produce 50 gpm. But this rule does not bar oral testimony to explain what the parties mutually understood when contract wording was indefinite or uncertain in meaning.) The Supreme Court said that "sufficient water" was indefinite as to meaning, and that the defendant's testimony that it was orally agreed that the well must produce at least 50 gpm should have been considered.

The drilling company's victory in

the suit rested wholly upon the fact that the defendant paid $1,000 "on account" after tests made by both parties showed that the flowage did not exceed 30 gpm. The court said: "The making of such payment, without any attempted reservation of rights, constituted a waiver by the defendant of any breach on the part of the plaintiff, based upon the insufficiency of the water obtained at the 202-ft. depth to which the well had then been drilled."

As to the water being "cloudy and a bit muddy" when a bailer test was made on the well at 202 feet, the Supreme Court said that such condition was usual in opening any new well.

The court treated as a separate transaction the plaintiff's claim for $389 for deepening the well from 202 feet to 264 feet, at the defendant's request. This additional item was allowed on proof that it was a reasonable charge.

Arthur L. H. Street

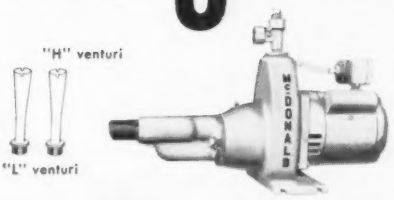
Mailbag...

(Continued from page 33)

tools and by churning them up and down, the gravel is forced out of the pipe. By repeating the operation three or four times there will be formed around the end of the pipe a pocket of coarse gravel which will prevent the lighter sand from rising. Some drillers, after forming a pocket, fill up the pipe for a distance of a foot or two with the coarse gravel. This is a good idea if there is a heavy pressure in the sand. If the wells are made in sand which is so light that it will lift, or so fine that the rate of travel of the water through it is slow, then the safest plan is always to use a screen.

In sand and gravel, a hole can be

stock 3 items



Adapto-Jet Pump, SW venturi

sell 5 pump jobs

McDonald's Minimum Inventory Maximum Application Plan keeps stocks low, sales high. You supply the right pump for any one of these five jobs and stock only three items.

JOB #1. suction lift.....25′
capacity.....up to 875 GPH
pressure.....up to 59 PSI
Pump—McDonald Adapto-Jet with SW venturi

JOB #2. suction lift.....25′
capacity.....up to 597 GPH
pressure.....up to 72.8 PSI
Pump—McDonald Adapto-Jet with "L" venturi

JOB #3. suction lift.....25′
capacity.....up to 364 GPH
pressure.....up to 100 PSI
Pump—McDonald Adapto-Jet with "H" venturi

JOB #4. suction lift.....50′
capacity.....up to 813 GPH
Pump—McDonald Adapto-Jet with "L" venturi and jet assembly in well

JOB #5. suction lift.....80′
capacity.....up to 600 GPH
Pump—McDonald Adapto-Jet with "H" venturi and jet assembly in well

For further information mail a card to

A. Y. McDONALD MFG. CO.
Dubuque, Iowa
PUMPS • BRASS GOODS
DRAINS • OIL EQUIPMENT

made most rapidly by driving pipe ahead and drilling out the plug, which has been forced up on the inside of the pipe. With driving ahead, care must be taken, however, to see that the pipe is not driven onto a boulder, which will collapse the end of the pipe or deflect it out of line. The blow used in driving should be just heavy enough to move the pipe. The bits should be dressed with a blunt penetrating point, that is, very little, if any, penetrating angle on the bits is necessary. A large area of crushing space should be given the bits for the purpose of retarding penetration and at the same time packing the material at the bottom of the hole to prevent the tools from diving and sticking.

University Asks Drilling Industry's Help In Conducting Survey

Dear Sirs:

It is our belief that, apart from the design criteria for wells developed in the various research laboratories, there are valuable criteria developed through long years of experience and experiment in the field by the well drillers and others working in the field. To this end, we wonder if you would care to publish this letter in your publication.

Utah State University has initiated a project to co-ordinate and compile information accumulated in both the field and the laboratory. It is proposed that this information be collected, carefully studied and evaluated, and a comprehensive report written. This report would contain a summary in terms of charts and tables which would help a well driller decide what would be the best procedure for a particular situation.

We would like to have members of the water well drilling industry furnish us with specific information regarding their procedure and experience as it relates to the following questions:

1. What should be the length of the screen or perforated casing, assuming that the aquifer is quite thick?

2. What should be the width of the screen openings and what should be their total area?

3. Under what conditions is a gravel pack necessary? If used, what should be the size of and gradation of the gravel? What should be the thickness of the gravel pack?

4. What is the safe wall thickness of well casing at various depths?

We would also appreciate an explanation of the reasons for specific answers given to the above questions.

Please send your information to Mr. P. K. Mohanty, College of Engineering, Utah State University, Logan, Utah. We hope that this undertaking may be helpful to the well drilling industry.

Sincerely yours,

D. F. Peterson, Jr., Dean
College of Engineering
and Technology
Utah State University

The Driller heartily endorses projects of this sort which are undertaken for the betterment and progress of the water well drilling industry. We urge anyone who can furnish the type of information requested to send it to the address mentioned in this letter.

Swivel Socket Clogs with Sand

Dear Sir:

In drilling wells, four inches or smaller in diameter, the swivel socket gives us trouble. When we're drilling in sand or sandrock, it clogs up with sand and doesn't function properly. What do you suggest we do?

A.H. Minnesota

We presume that you have reference to the mandrel and cable binding or wedging in the rope socket neck, caused by becoming clogged with fine sand and cuttings. Ordinarily, drill cuttings will wash out from around the mandrel and cable, as there are holes drilled in the body of the socket below the swivel for this purpose. Possibly these holes are not drilled deep enough to connect with the center hole, and we suggest that the socket be inspected carefully to see if such a condition exists.

Another way you may prevent the

(Continued on page 52)

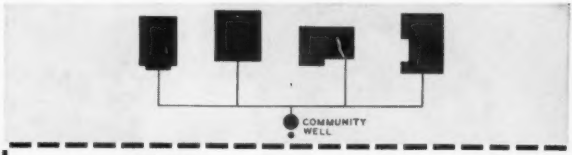
motors for every

Sell the "Water System of Tomorrow" ...TODAY!

FIRST All-at-the Well System!

Sell the "nearest thing to central water convenience" for faster profits, enthusiastic customers — with new MORRISON Aqua-Flo WELL-TANK SYSTEMS! New exclusive Well Head Unit permits burying tank *right at the well.* Avoids pressure tank nuisance in the home, avoids pump house or pit, lost space, extra adapters, conduits, extra welding. Well Head Unit fits well casing without welding or cutting, includes built-in check valve, snifter-type air charger, junction box, tank intake connector, thermostatic heater and ports for ventilation and service. You save installation time and labor, do a better job faster.

Check ALL the advantages of the new Aqua-Flo WELL-TANK SYSTEM NOW. Fits well casings from 4" to 7" *without adjustment.* Tank sizes, 60, 120 and 265 gallons. Use with submersible pumps. Meets all sanitation codes. Provides a "main" type water system often at savings of hundreds of dollars for your customer.



New Aqua-Flo Well-Tank System simplifies water supply to other buildings.

Be FIRST in your town with the *latest!* Check the Coupon for the whole story.

THE *Morrison* COMPANY

Dept. D, 125 W. Melvina St., Milwaukee 12, Wis.

Quick! Tell us more about the advantages of the new MORRISON Aqua-Flo Well-Tank "Water System of the future."

Name .....

Address .....

City ..... State .....

Attention of .....

motors for every

Vertical Hollow Shaft Motors 1 to 700 hp

Heavy, solid cast iron frames that can't dent or rust through. Also, sealed bearing chamber . . . metered oil flow . . . dual ventilation. Avaliable in weather-protected, TEFC and explosion-proof models.

Jet Pump Motors 1/3 to 3 hp

Exclusive totally-enclosed end-mounted starting switch — sealed from dust and dirt. Controlled ventilation for uniform cooling of windings and rotating parts. Dust-carrying air is directed *away* from bearings for longer life.

Horizontal Integral Motors 1 to 800 hp

Single or polyphase . . . with every variation.Open weatherproof, TEFC or explosion-proof; all voltages, any insulation required. These motors feature a unique lubrication system with bearings that *can't* be overgreased.

Horizontal Fractional Motors 1/3 to 1 hp

Single or polyphase, rigid or resilient base in your choice of voltages with more than 2000 "standard" fractional variations. A. O. Smith offers the largest selection of electrical and mechanical modifications in the industry. All models feature permanently lubricated shielded ball bearings for longer life.

pump application

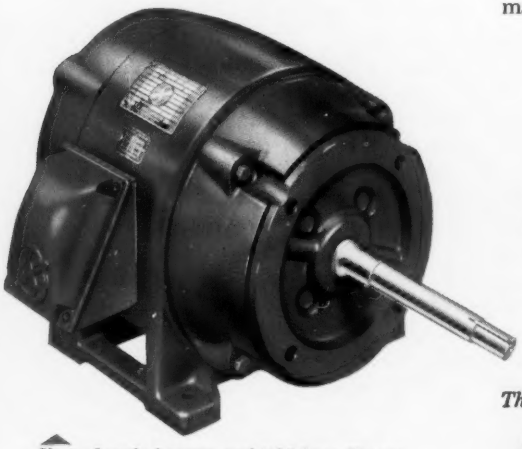
Vertical Solid Shaft Motors 1/3 to 800 hp
Feature the same heavy, trouble-free construction as A. O. Smith Vertical Hollow Shaft Motors . . . excess thrust capacity . . . grease-lubricated shielded bearings for added service life.

domestic industrial agricultural

WIDE CHOICE ASSURES PROPER SELECTION . . . UNDER ALL OPERATING CONDITIONS

Dependability, rugged construction and design that provides the extra stamina to walk through motor-killing loads are three good reasons why it pays to specify A. O. Smith pump motors—1/3 to 800 hp.

But more, you get a wide range of HP in every type plus an exceptional range of electrical and mechanical modifications. Result—A. O. Smith pump motors can be matched exactly to the job at hand.



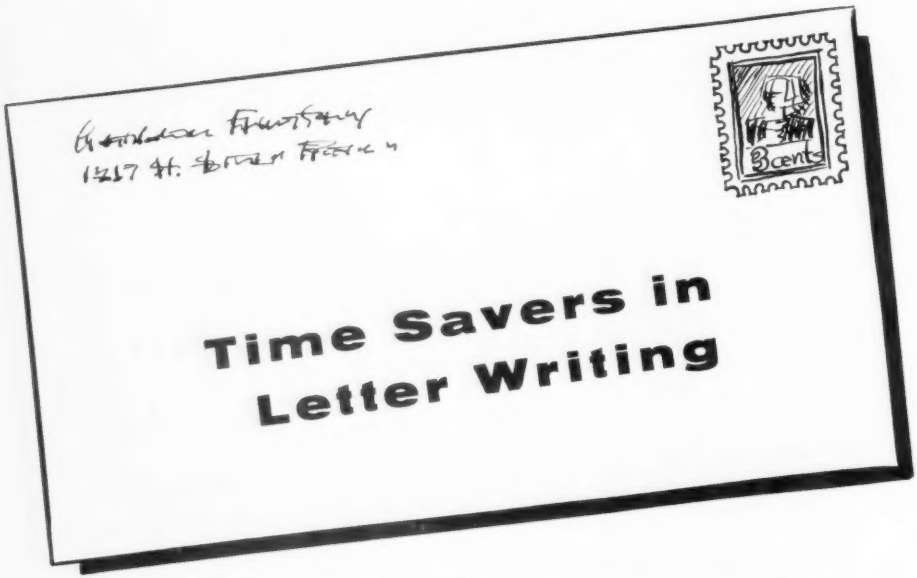
Close-Coupled pump and "C" Face Motors 1/3 to 150 hp
Slash installation costs and time. Flange bolts directly to pump casing. Pump impeller mounts directly on shaft. On all close-coupled and "C" face pump motors, extra care is taken on all machine tolerances to assure alignment of pump impellers.

For complete details, see your A. O. Smith motor man or write direct.

Through research . . . *a better way*

A.O.Smith
CORPORATION
ELECTRIC MOTORS
Tipp City, Ohio

A. O. Smith International S. A., Milwaukee 1, Wisconsin, U. S. A.



Time Savers in Letter Writing

By observing these basic principles of letter writing, you can save much time and effort in performing this necessary but often dreaded chore. You may even find that letter writing can be fun.

by Ernest Fair

No day passes without the average drilling contractor facing one of his biggest time-consuming tasks, i.e., business letter writing. While many other equally important chores stack up precious periods of each day, time must be devoted to what is often considered a tedious task.

Handling the office correspondence need never be such a chore or time waster. The millions of words written on good business letter writing have brought to light just about every step the average contractor needs to do the job right. Far too little has been written on how to handle the task itself in the minimum amount of time and yet sacrifice nothing which contributes to making certain it is done right.

That's why we've asked a number of contractors noted for the speed with which they handle letter writing duties how to go about it; from the answers received, here are a number of suggestions which can enable any other contractor in any spot, large or small, to do his letter answering and writing chore with a minimum of time being consumed every business day.

Outstanding of all answers received, since they were mentioned in almost every case, were three time savers which should be fixed in one's mind and kept there—even jotted on a note pad and left in plain sight on the desk all of the time. These are:

1 — Be brief
2 — Be friendly
3 — Be firm

Following these three simple rules

will speed up handling of correspondence, since they will encourage brevity (which in itself is a time saver) in every communication as well as present our ideas and suggestions in the very minimum of words.

"Be sure all of the data you need to handle the correspondence is at hand first," is another suggestion mentioned often, "simply because, where you handle each separate problem as it arises, you are not only wasting your own time but everybody else's as well.

"You will also find that setting up everything in advance will automatically reveal how two or more letters in the day's stack can often be answered with the same reply or with paragraphs changed around from one to the other to reduce writing time."

Use of Standard Paragraphs Helpful

More and more use of standard paragraphs will follow from such practice, and you will see how much more quickly each day's correspondence can be handled through the use of such standard letter-answering paragraphs.

Many problems of identical nature come up day after day; writing a new and separate letter to handle each and every one is sheer waste of time when it can be handled equally well with a number of standard paragraphs already written and kept in a notebook for that purpose. All we have to do is insert the proper paragraph and a 15-min. chore can be reduced to one of a minute or two.

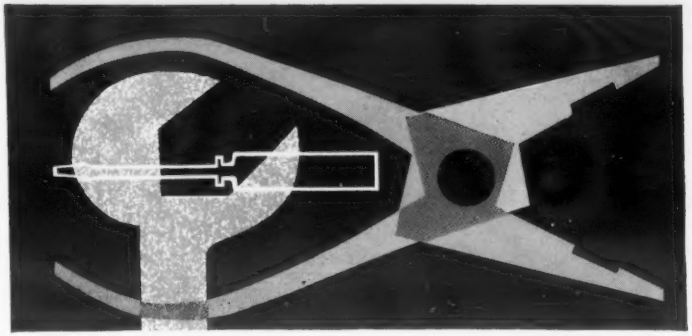
It also pays to take time to go through the mail first and organize it carefully before answering chores begin. Too often we look on this as wasted time, with the thought that we can sort as we go along. Actually much more time is consumed in this manner than in the one suggested. A proper sorting permits you to handle a heavy volume of correspondence in groups of related topics where it will be obvious one answer can handle a half dozen or more letters.

Time of Day Important

Picking the right time of the day in which to handle that correspondence is also important. Where a number of mails come in it is much better to set the time after all are in rather than take care of correspondence as it arrives with each individual mail. Seldom, if ever, is any matter so pressing that it cannot await an answer for a few hours, and in most cases such actual letters may not be dispatched at the post office until one set time, no matter how often a day we drop them into the mail chute.

Few are the contractors who cannot find ample opportunity for use of additional time in each business day. Taking these steps to cut down on time waste in handling business correspondence is one sure way to secure those needed extra moments.

"Will you please change that 'Bargain Counter' ad to read 'Master Driller' instead of 'Drill Master.'"



A wrench . . . a screw driver . . . a pair of pliers

that's all you need to service this pump **on the spot**

A bolt of lightning . . . a backwash of sand . . . might stop even this Goulds submersible—as it might *any* pump.

But this pump is not an ordinary Sub. There's a difference. You can dismantle this pump *yourself* to get at the trouble. You can do it on the spot.

You use ordinary tools. Follow the step-by-step instructions that come with every pump. You'll find that

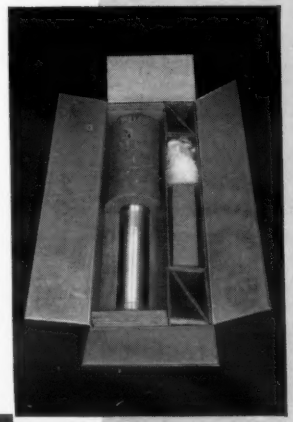
every part of a GOULDS Sub can be repaired or replaced IN THE FIELD—easily

When you don't have to return a pump for repair, you not only save time and money—you build good will with your customer.

And you have good will on which to build. It began when you sold a Goulds series UA submersible. Its bronze and stainless steel construction resists rust and corrosion inside and out. Even its custom packaging proclaims the pump's quality.

Goulds Series UA subs are available in 10 sizes in 3 groups—⅓ through 3 HP. Capacities to 1170 GPH; for depths to 860 ft.

For more information, get in touch with your Goulds distributor or write Goulds Pumps, Inc., Seneca Falls, N. Y.



Each Goulds Series UA Water System, carefully cartoned, contains all items except cable and pneumatic tank. Pump and motor are fully protected by many layers of corrugated board.

Submersible

GOULDS

Water Systems

BITS *from the wit sharpener*

After the flood water had receded, Noah spoke sternly to all the members of the Ark: "Obey the Lord's word," he told them. "Go forth and multiply."

All the animals left the Ark except two little snakes Noah discovered curled up in a corner. "What are you doing here?" he demanded. "Didn't I tell you to go forth and multiply?"

"We can't," was the disconsolate reply. "We're adders."

First Cannibal: "Am I late for dinner?"

Second Cannibal: "Yes, everybody's eaten."

An editor received a story from one of his reporters about the theft of 2,025 pigs from one farmer. Curious about the large number, he phoned the farmer. "Are you the farmer whose pigs were stolen?" he began.

"Yeth, I thure am," replied the farmer.

The editor thanked him, turned and rewrote the story about the theft of two sows and 25 pigs.

Rastus was dead. A wonderful funeral was in progress. The preacher talked at length of the good traits of the deceased, what an honest man he was, what a loving husband and kind father.

Finally, the widow whispered to one of her children, "Go up dere and take a look in de coffin and see if dat's your pa."

A young chap was told he could have a job in a clothing store if he sold a certain suit. And it was a dilly —light purple with white stripes and red dots. But the applicant said: "O.K. It's a deal."

About an hour later the manager saw him come running, his pants torn, blood on his hands and a wild look in his eye. But he panted out: "I sold the suit."

"But you seem to have encountered quite a lot of customer resistance," the manager said.

"No, the customer was easy," the new clerk replied, "but I sure had a bad time with that seeing eye dog!"

While visiting a Redskin Reservation as part of a tour, a dear old lady approached an ancient chief and asked him: "What do you do all day here?"

"Hunt and drink," replied the Indian.

"What do you hunt?" asked the old lady.

"Drink," said the Indian.

"Calm down, son," said the father of the marriageable daughter to the fidgeting young man. "I bet you want to marry my daughter and you're shy about asking for her. Well, take her, my boy, marry her and good luck to you."

"Oh no, it wasn't that, Mr. Smith," the suitor answered. "I just wondered if you could lend me $25."

"Lend you $25!" exploded Dad. "I should say not! Why, I hardly know you!"

"I see by the paper that in India a wife can be bought for two dollars. Isn't that awful?"

"Oh, I don't know," answered her husband. "A good wife should be worth that."

Cub reporter to editor of small newspaper: "Hey chief, I've got a lead on a red hot news item!"

Editor: "What happened. Man bite dog?"

Reporter: "No, but a fire hydrant sprinkled one."

Jimmy was telling his pal that his daddy had given him the best birthday present ever—a little puppy.

"What kinda puppy?" the friend wanted to know.

Jimmy thought a bit. "The mixed up kind," he said brightly. "You know, sort of a cocker scandal!"

The last train had left and the resort was over-filled. A man and a woman were dickering for rooms. "All I can offer you is a double room."

"Impossible!" exclaimed both. But since there really weren't any more rooms, they both finally hesitatingly agreed. They introduced themselves to each other. The porter set up a screen between the two beds and the woman went to bed. Half an hour later the man went to bed. He had just fallen asleep when he heard her call:

"Would it disturb you, Mr. Parker, if you were to get me a glass of water?"

Parker replied, "Would it disturb you if you were to play the role of Mrs. Parker tonight?"

Short pause: "No."

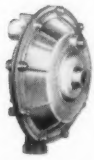
"Then just get up and get your own silly glass of water!"

Now You Can Stock and Sell

One Line of Water System Parts

Designed to give maximum efficiency and long, trouble-free service, Brady water system parts improve any water system. Stock and sell Brady parts . . . supply the best . . . reduce your inventory problems. Maximum discounts for stocking wholesalers mean added profits.

THE *Brady* LINE



Standard of in industry available in all required sizes.

Only tanks engineered for domestic water systems—doubly resistant to corrosion.

Handle more water without choking—Three sizes available—"Water flows free as a waterfall."

For complete information and discounts, write

Brady COMPANIES 18th and Ebright Streets, Muncie, Indiana

LET *Monitor*® PITLESS GO TO WORK FOR YOU

Monitor PITLESS

FIRST in the Nation in Sales
FIRST in Completeness of Line
FIRST with O-Ring Seals
FIRST with Seal Protection From Installation Damage*
FIRST with Accessible Check Valve*
FIRST with Integrated Air Charger*
FIRST with Hot Dip Galvanizing
FIRST with Practical Motor Control at the Well†
FIRST with 5-Year Guarantee

More and more well drillers and pump men are finding that Monitor Pitless construction *works* for them and their customers by solving the water system problems of contamination, freeze up, fire protection and emergency pumping and by saving installation and service costs.

Add a *worker* that solves problems and saves cost by choosing from Monitor's 117 Pitless varieties for your next job.

* *U. S. Patent No. 2,657,633*

† *Patent Applied for*

BAKER Mfg. Co., Evansville, Wis.
Please send me the 1958 Monitor Catalog

NAME _____

OCCUPATION _____

STREET _____

CITY _____ STATE _____

MY DISTRIBUTOR IS _____

CITY _____

Tribute to a Driller

by Esther M. King
Rochester, Wash.

"I'd sure like to see that well developed."

Almost two years have passed since my well driller husband spoke those words. He was sitting on the bed, an oxygen mask strapped about his head, his breath coming laboriously.

Our son, who now owns the business, was loading the equipment necessary for installing the pump and testing the well, which he had drilled some weeks before for the city of Oakville, Wash.

My husband had been suffering from the aftereffects of virus pneumonia for several years, and was unable to work out on the job. However, his interest in the work, and his love for it never diminished until the day of his death, just five days after the Oakville job was completed.

I was a well driller's wife for 28 years, some of them hard years, but never lacking in thrills and adventure. When I married my husband, I did not realize I was marrying a young man who was held in his mother's lap at the age of 2, while she sat, hour after hour, driving the horses around and around, generating the power which ran the old Kelly-Tanneyhill his father was operating. This was in Kansas about 1906.

Is there any sweeter music to the ears of the well driller's wife than that of the jingling of the tools, rocking noisily back and forth as her husband starts out from home, heading for the job that has just come in? Not to me, unless it is when she sees him coming home, turning in the driveway and tooting the horn, loudly proclaiming that another well is finished.

I did not realize as time went by, and I was busy raising a large family, how the love of this work was creeping into my own heart. Although our son is married, and the business carries a new name, there is still an occasional phone call that comes to me. There is a twinge of excitement and expectancy when I hear the familiar question, "Can you tell me where I can get a hold of the well driller?"

My husband was not a prosperous driller if you are thinking in terms of the money he made, but he was successful. He was successful in that he patiently listened to the prospective customer's needs and wishes, remaining on the job until he had fulfilled those needs to the best of his ability, and the customer was satisfied. Many times I knew him to carefully explain to the worried housewife that the generous flow of what appeared to be only mud, would in a few hours be sparkling clear, waiting for its desired place in the faucet of her kitchen sink.

Is it only fancy that the turf is a richer green over the place where Charles awaits the resurrection day? The water, which the caretaker so freely uses to beautify the cemetery, comes from a well drilled by my husband four years ago.

Mailbag . . .

(Continued from page 40)

swivel or mandrel from wedging and to keep it working freely in the body of the socket, is to drill a ½-in. hole through the collar of the socket, about 2½ inches above the mandrel on each side. This allows the water to circulate down via the wire line and carry out the cuttings. It will not weaken the socket as all the strain comes at, or below the swivel.

Well Near Filtering Bed Produces Polluted Water

Dear Sirs:

In September I completed a well to a depth of 79½ feet for a building speculator. The well produced about 18 gpm and it was 16 feet to bedrock, very soft shale.

Because of a change by the builder in the dimensions and location of a sewage filtering bed near the spot where the well was drilled, the well became polluted. I was called in by the builder to see what was wrong. The plastic pipes were removed so a test could be made to see if any seepage was coming in from under the casing, but this did not reveal any seepage.

I was asked to bring in my drilling rig to repair the well. I told the builder that I would not bring in a drill, but instead would try to repair it in a different manner. He insisted that the trouble was due to a faulty casing seal.

In order to satisfy the customer, I proceeded in this manner. (Incidentally, a 20-ft. length of 4-in. pipe had been accidentally dropped into the well by the builder and had been left there.) First I cement-grouted a 20-ft. length of 4-in. pipe in the well. This put me four feet below the original casing. A few days later, a dye test was made and the water was still found to be polluted. I then proceeded to install a 30-ft. length of 3-in. pipe. I wrapped a clean burlap bag around the bottom of the pipe and filled the space with five and one-half bags of grout.

I now plan to set a drill up over the hole and drill it back to its original 6-in. diameter. Considering all the material already in the well, do you think this would be feasible or advisable?

A. C. New York

Dear Sir:

If seepage resulted from this well being near the filtering bed, we doubt if it could be observed by looking down the well, as intimated. Seepage could, of course, occur, resulting in pollution through the rock as described and it is doubtful if anything can be done to correct the situation as far as the existing well is concerned.

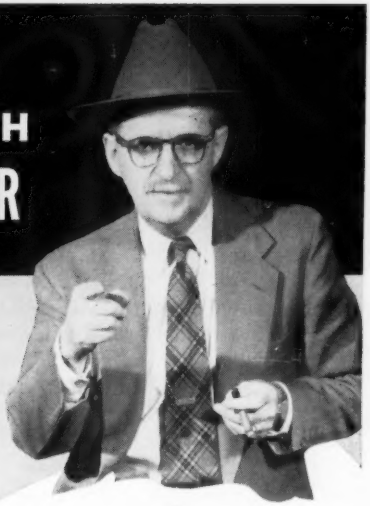
We assume the 20-ft. length of 4-in. pipe which was accidentally dropped into the well is resting on the bottom at 79 feet. It is not quite clear how you grouted the second length of 4-in. pipe, but we assume you wrapped it with burlap in the same manner that you did the 30-ft. piece of 3-in. pipe and then filled the space with grout.

Be that as it may, it appears that you are desirous of opening the well to the original 6-in. diameter for some reason or other. It is apparent that you expect to drill up all the pipe that is in the well. This means drilling up about 40 feet of 4-in. pipe and 30 feet of 3-in. pipe, along with a certain amount of cement grout.

Advise Drilling New Well

It would be better if you could remove the 3-in. and 4-in. pipe before doing anything with the well, but, lacking a ripper, the job might be too expensive. It will probably take several weeks of pounding to drill up this pipe and we frankly do not think the results would justify such action. Even if you were able to drill the pipe up or remove it, you would still be faced with the problem of pollution. The safest measure, in our opinion, would be to drill a new well some distance away from the filtering bed if there is land or space available. You could drill a new well a whole lot faster, and with less expense than would be required if you were to fuss with the existing well.

WE WANT TO DO BUSINESS WITH YOU, MR. DRILLER



WRITE ME! FRED HORN, MANAGER PUMP DIVISION.

"I'll tell you how you can make more dough, selling Uniflow!"

A COMPLETE LINE!

UV (convertible) single stage jet pumps

OTHER UNIFLOW PRODUCTS— PISTON PUMPS, TWO STAGE PUMPS, CELLAR DRAINERS, WATER CONDITIONERS, WATER COOLERS, COMMERCIAL REFRIGERATION PRODUCTS.

UNIFLOW MFG. CO. • ERIE, PENNSYLVANIA

Acidizing . . .

(Continued from page 27)

pacity of a new well that was acidized was 25%. We have also had some that were acidized in which there was no noticeable increase at all.

It would be well to mention here that anyone acidizing or attempting to acidize a well should be sure to get as much information as possible on the type of acid to be used. All recommended precautions should be taken in handling of the acid. We always have on hand a barrel or two of clear, clean water and a couple of boxes of baking soda, just in case we have an accident. Also, acid should never be used in a closed building, pit or pump house, as the fumes from the acid, if inhaled excessively, are fatal.

Experiment with Hydrofracing of Wells

We have had our best results on low-producing wells with a new method almost unheard of in the water well field. This method, in the oil fields, is known as hydro-fracing. The principle and process as used in the oil fields is patented. The process we have used varies somewhat from the process of the oil fields, but the principle is primarily the same. It involves the hydraulic lifting of the producing formation by mechanical induction of pressure at the point of production and mechanically inducting a substance into the producing formation to support it after the pressure has been relieved to keep it from collapsing again.

The water wells that we have fraced have been done on an experimental basis, as there was no technical data available for us to work on. Our first two attempts were unsuccessful and they had every good reason to be. The first one was a dry hole with no water at all. This was to prove the theory that a fracture could be made possible with the equipment and method that we were using. The fracture was accomplished and proven. The second hole on which we attempted fracture was a well that produced ½ gpm. This one was unsuccessful because we were not able to pump enough fluid out into the formation to get the lifting action needed to accomplish the fracture. This was a 50-ft. well and, under normal conditions, two pounds of pressure per foot of depth and a proportionate volume of liquid will accomplish the fracture. In this case, we ran the pressure to 600 pounds, and held it that way for nearly an hour, but nothing happened. This was the maximum rating on our pump and equipment. It was six times what normally would be required.

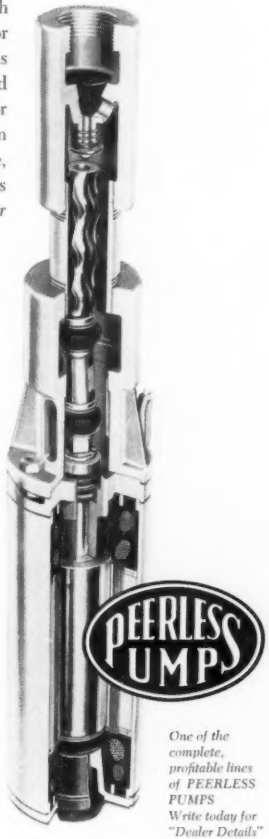
Third Attempt Successful

The next and third attempt, made on another well, was successful. This well was producing 2½ gpm. After the successful fracture, it was pumped at 5 gpm, a 100% increase in capacity. Our fourth and last attempt of this series of fractures was on a well that had been in service for approximately six months. This one, too, had been producing 2½ gpm and, after a successful fracture on it, the well yielded better than three times the original capacity.

Both of these successful frace jobs have been in service now for about a year and a half and are holding up much better then we had expected. Whether or not they can be considered permanent, time alone can tell. We think that it will open up an entirely new field in the development of small producing wells.

Dynaflo®
SUBMERSIBLE PUMP

Worry-free, minimum maintenance pumping is what you sell with the Peerless Dynaflo submersible pump! No rods, jets, shafts or impellers to wear out; the unique lifetime-lubricated Dynaflo has only one moving part – the stainless steel rotor. Rotating in a hard rubber stator, the rotor transmits the water through the stator stages into the discharge chamber, efficiently and *silently* in capacities up to 1680 gph from wells up to 400 ft. deep. Positive, foolproof and full-flowing, this member of the famous Peerless domestic water system family means *better pumping for your customers, more profit* for you! Sell the finest – sell Peerless.



One of the complete, profitable lines of PEERLESS PUMPS Write today for "Dealer Details"

IT'S THE DIFFERENCE THAT SELLS!

NO | SHAFTING
JETS
IMPELLERS
RODS
NOISE

Putting Ideas to Work

fmc FOOD MACHINERY AND CHEMICAL CORPORATION

Peerless Pump Division

Plants: LOS ANGELES 31, CALIFORNIA and INDIANAPOLIS 8, INDIANA

FOOD MACHINERY AND CHEMICAL CORPORATION • PEERLESS PUMP DIVISION • 2005 Northwestern Ave., Indianapolis, Indiana
Please send me Peerless Pump Bulletin No. B-2423 "The Peerless Convertible Strata Jet"

NAME_____ POSITION_____

COMPANY_____ ADDRESS_____

CITY_____ ZONE_____ STATE_____

STA-RITE

SUBMERSability

* what it is...
* what it does...
* what it means

* what it means to you...

STA-RITE "Submers*ability*" means that the Sta-Rite submersible pump is much more than just another submersible pump. Use these yardsticks to measure Submers*ability*.

Ability to use less power pumping from deeper wells, permitting lower selling price per foot. Dependable, heavy-duty motors and efficient, improved impellers promise this *ability*.

Ability because the unique strap design assures easy pump service right at the well—and because now you can do more service without pulling the pump. We show you how.

Ability because just four Sta-Rite models in four different stagings put you in business where most of the business is. For instance—37% of the submersible market is in ½ HP units and 40% is in ¾ and 1 HP pumps.

Ability because Sta-Rite recognizes shifting consumer demand for the quiet, in-the-well features of submersibles. Aim for the cream of the market, with Sta-Rite. Selling Sta-Rite pumps puts you in, right now, with the hottest line in the business—the profitable line.

Especially for you...

A dealer promotion program to identify you as the *expert* pump man in your community.

All new—with **your** name printed way up front in big, bold letters —

Highway Signs • Tacker Signs
Building Site Signs • Faucet Hang Tags
Special Dealer Mailer with Your Name and **Picture**
Decals • Permanent Instore Displays
Matches • Trademark Service...

plus National Advertising in Better Homes and Gardens, Sunset, Successful Farming, and other leading magazines.

Write for complete "Dealer Name" kit.

STA-RITE

STA-RITE PRODUCTS, INC.
DELAVAN, WISCONSIN

CHAMBLEE, GA. • LOS ANGELES, CALIF.
DAYTON, OHIO • MIAMI, FLA.
SHERMAN, TEXAS • DENVER, COLO.

IN CANADA: Sta-Rite Pumps (Canada) Ltd.

News...

(Continued from page 31)

Alathon 25 pipe character. Four grand prizes, one for each of four regions, are 1958 Ford Rancheros. One hundred other valuable prizes will be awarded in these four regions. The contest opens March 1 and closes midnight July 31, 1958. Dealers can use one, two or three words to name the character.

Territory Change for McJunkin Corp. Announced

A change in the territory covered by McJunkin Corp., Charleston (W. Va.) distributor of its line of water well drills, has been announced recently by Bucyrus-Erie Co., South Milwaukee, Wis. The change involves the addition of certain counties in Pennsylvania, West Virginia and Maryland which were formerly served by Beckwith Machinery Co., Pittsburgh, Pa.

The new territory covered by McJunkin Corp. consists of:

Pennsylvania: South of and including the counties of Erie, Crawford, Venango, Clarion, Jefferson, Clearfield, Center, Blair and Bedford.

Maryland: Garrett and Allegheny counties.

West Virginia: Entire state will now be covered.

In addition to the new territory, the firm will continue to cover its former territory, which includes:

Virginia: The counties of Highland, Bath, Allegheny, Craig and that portion west of and including Giles, Pulaski and Carroll counties.

Kentucky: East of and including the counties of Pendleton, Harrison, Scott, Woodford, Mercer, Boyle, Casey, Adair and Cumberland.

The McJunkin Corp. recently purchased the Chandler Boyd Co. of Leetsdale, Pa., which now operates as its subsidiary, stocking a complete line of Bucyrus-Erie parts and drilling and fishing tools.

Deming Appoints New Representative

The Deming Co., Salem, Ohio, has announced the appointment of Larry Griehs as district representative for parts of Indiana, Ohio and Kentucky. Griehs will cover the area in Ohio, Indiana and Kentucky south of Route 40 between Columbus and Indianapolis.

Griehs came to Deming in September, 1957, after five years of pump sales experience in Texas, Oklahoma, New York and the New England states.

Geology...

(Continued from page 25)

counter, in the order of their importance as water producers.

Water-producing Formations

1. Well Graded Gravel Deposits, Free from Sand. Such formations cannot be approached by any other formation as water producers. These ideal conditions are seldom found, but a driller should know that wherever he encounters a bed of clean, coarse gravel, he has a formation which absorbs water freely, stores it in large quantities, and yields it readily.

2. Bank Run, or a Loose Mixture of Sand and Gravel. This is more frequently found. Where percentages of gravel are high, better yields may be expected because, after proper development, material immediately surrounding the well more closely resem-

bles a well-graded gravel deposit.

In some areas, mineral matter carried in the water causes a cementation of particles. Such formations can be recognized by the action of the tools and bailer. The cementing agents are usually carbonates of silica, calcium, or iron oxide. Another form of cementation is produced by fine particles of clay, silt, or mud in the formation.

When the gravel stones are round and water-worn, and have been cemented together, the formation is known as conglomerate. If cementation occurs against angular or sharp pieces similar to rock fragments, the formation is called breccia. Conglomerate and breccia are usually dry, but water has been found running in channels through such formations. In Chile there is a dug well 14 x 14 feet, all conglomerate for 85 feet. At 42 feet one can see a 6-in. stream of water running into the shaft from one side. It was reported that below the dynamic water level, there was even more water entering the shaft in a like manner.

The size, shape, and percentage of coarse particles in any bank run formation are infinite. To a great extent, the size of individual grains controls the amount of water which may be obtained. Another important factor is the percentage of spaces or interstices between particles. A third factor is the percentage of fine sand particles which actually determine the yielding ability of the formation.

On the other hand, clay in minute quantities will build up into a mass of paste, sometimes forming chunks that are almost impossible to break down. It is not uncommon to encounter layers of sand and gravel in clay

(Continued on page 66)

VALLEY STEEL PRODUCTS COMPANY

Louisiana, Missouri

NEW AND USED WATER WELL CASING

LINE PIPE

ALL SIZES
ALL WTS.

IRRIGATION PIPE

GALVANIZED
BLACK

OIL WELL CASING AND TUBING

FREE QUICK DELIVERY — YOUR YARD OR JOB SITE
WATCH FOR OUR TRUCKS — THEY DELIVER IN YOUR STATE

O. F. MALY
Day Phone: 449
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T. W. HARNESS
Day Phone: 447
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CALL COLLECT • BUY DIRECT

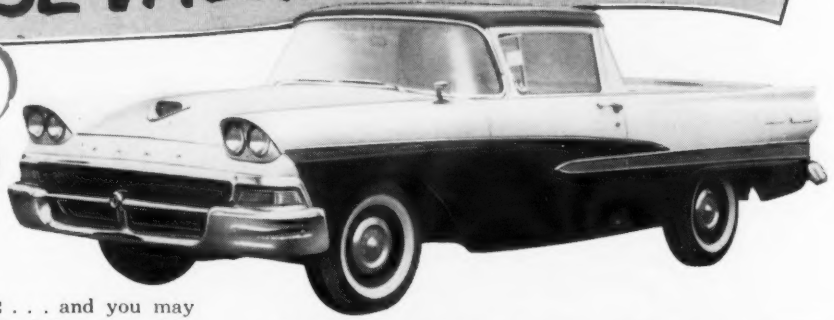
Service 24 hrs. per day for ***365 days a year***

ECONOMICAL PRICES • QUICK DELIVERY • SATISFACTORY SERVICE
WATER WELL CASING AND PIPE OUR SPECIALTY

PLASTIC PIPE CONTESTS

WIN THESE VALUABLE PRIZES

"It's easy! Just NAME ME!"



"NAME ME . . . and you may win a 1958 Ford Ranchero pick-up truck! Or any of the exciting prizes shown below!"

FOUR 1958 FORD RANCHEROS

100 ADDITIONAL HIGH-QUALITY PRIZES

WHO'S ELIGIBLE:

Anyone in the United States who buys pipe of ALATHON® 25 polyethylene resin from jobbers or distributors and sells to users. This includes retailers, plumbers, well drillers, etc.

HERE'S ALL YOU DO:

HOW THE CONTEST WORKS:

Enter as often as you wish. Submit one name only on each official entry card.

All entries must be submitted in your own name, but that doesn't mean you can't get some help in thinking of the names. Why not make this a family

property of E. I. du Pont de Nemours & Co. (Inc.), to be used as it sees fit.

WINNERS WILL be notified by mail as soon as possible after each contest closes. A list of winners will be sent to any contestant requesting same and enclosing a stamped, self-addressed envelope.

HERE'S ALL YOU DO:

1. Detach official entry blank on your current shipment of pipe made of ALATHON 25 manufactured by Anesite Company, Crescent Plastics, Inc., Franklin Plastics, Inc., Plastic Pipe & Tube Div., Plastic Process Company, Republic Steel Corporation and Yardley Plastics Company. (If you are not stocking pipe of Du Pont ALATHON 25, ask your jobber or contact any of the manufacturers mentioned to learn how to get in on these exciting contests!)

2. Choose a name for the pipe character.

3. Fill out and mail the self-addressed entry card. Entries must be postmarked by midnight of closing date of each contest. (Starting and closing dates of each contest are listed under prizes.)

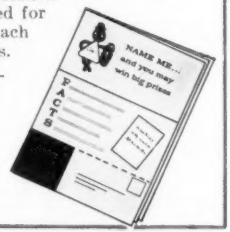
names. Why not make this a family game? Ask the wife and kids to join you in suggesting names. You'll be surprised at how many names you can think of in only a few minutes. You don't have to limit the name to one word, either; use two or even three.

Prizes will be awarded for the best names received from each region shown below on map. Judging will be by an independent organization, on the basis of originality and aptness of thought. If more than one person submits the winning name, duplicate prizes will be awarded. Decision of the judges will be final. No entries will be returned. All entries and ideas therein become the

stamped, self-addressed envelope.

Each region will have five winners in each of the five contests. (Prizes and closing dates shown below.) After the fifth contest, all winning entries (25 from each region) will be judged for grand prizes, and a Ford Ranchero will be awarded for the best entry in each of the four regions.

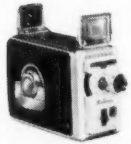
Contests are subject to federal, state and local regulations.



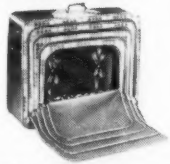
Here are prizes and contest dates:

20 WESTINGHOUSE CALENDAR CLOCK-RADIOS
Contest No. 1 starts March 1, ends midnight, March 31

20 WARING BLENDORS
Contest No. 2 starts April 1, ends midnight, April 20



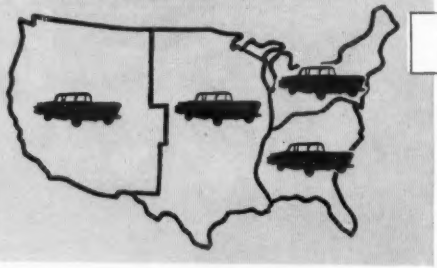
20 KODAK MOTION PICTURE CAMERAS
Contest No. 3 starts April 21, ends midnight, May 11



20 LEEDS NESTED LUGGAGE SETS
Contest No. 4 starts May 12, ends midnight, June 15

20 ZENITH TRANSISTOR POCKET RADIOS
Contest No. 5 starts June 16, ends midnight, July 31

There is a difference in flexible plastic pipe... specific quality pipe made of **ALATHON® 25.**

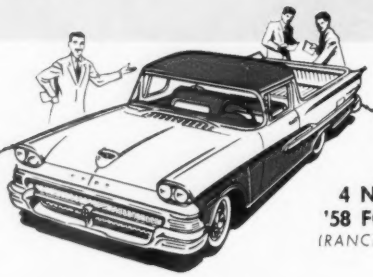


ONE FORD RANCHERO WILL BE AWARDED IN EACH REGION SHOWN ON MAP

DU PONT
REG. U.S. PAT. OFF.

Better Things for Better Living . . . *through Chemistry*

Mr. Dealer: GET IN THE WINNERS' CIRCLE



4 NEW '58 FORDS (RANCHEROS)

with

YARDLEY

There's an entry blank in every coil of Yardley pipe

Fill out... mail in... nothing else to do!

DU PONT'S PLASTIC PIPE CONTESTS

See the Du Pont "NAME ME" Contest announcement ad in this issue of the Driller

MAIL COUPON NOW FOR THE NAME OF YOUR YARDLEY PIPE DISTRIBUTOR

YARDLEY

Yardley Plastics Co.
142 Parsons Ave., Columbus 15, Ohio

Send me further information on the Plastic Pipe Contests and the name of my Yardley pipe distributor.

Name _____

Company _____

Address _____

City _____ **State** _____

BARGAIN *counter*

All advertising in this section is payable in advance. Enclose your check or money order with copy. Rate: $1.00 per line. Minimum charge $4.00. No discounts; no commissions. Count your own copy to avoid delay. The average line contains 28 characters (20 characters if all capital letters are used). Count spaces and punctuation as one character each. Allow 10 characters for box number if blind advertisement is desired. Closing date — 5th of preceding month. Example — January issue closes December 5th. Be sure to address separate inquiries to each advertiser by using the correct box numbers. Mail Box inquiries care of THE DRILLER, South Milwaukee, Wis.

DRILLS FOR SALE

1—2" to 4" jetting machine, custom all steel, 30' derrick with pipe braces, complete with 1½" jetting pump, 600# hammer, water swivel, complete string of hollow rod tools, including bits and small tools. Price: $1600. Contact: A. L. Cox & Company, Inc., 202 W. Marion St., Mishawaka, Ind. Phone: Blackburn 9-3791.

20-W Bucyrus-Erie purchased new in 1955 mounted on F-6 Ford truck with new truck motor. Drill equipped with casing reel, complete starting equipment, tool guide, spooling device, blower, new drilling and sand lines and steel cat walks. Complete outfit in excellent condition. Price: $4950.

1955 Chev ¾-ton pickup truck also in excellent condition at extra cost. Wayne Fischer, 155 Glass St., Suncook, N.H. Phone: HUnter 5-3745.

Dunlap reverse circulation rotary irrigation well drilling rig. A-1 condition.

Failing 1000 Holemaster test rig. Also top condition.

Owner deceased. MUST SELL. For complete details write: Virginia Thomson, 5415 E. Osborn Rd., Phoenix, Ariz.

Failing 1500 H.D. drill with 4½ x 6 pump, automatic pull-down. Mounted on F7 Ford. Also Griffin water tank, 1951 truck. Will take 22-W or equal on trade-in. John D. Akin, Box 123, Lamont, Iowa. Phone: 2574.

DRILLS FOR SALE

1950 Model 22-W with casing hoist and power derrick lift. Machine and motors recently overhauled and repainted and in first-class shape. Mounted on a very good late model Chevrolet truck with four-speed axle. Equipped with cable but no tools. Price: $4300.

20-W, two years old, like new. Mounted on a good International truck, equipped with casing hoist, self-starter and power derrick hoist. Price: $4300. Wilson and Beemer Supply Co., Albert Lea, Minn.

For Sale — Available for Immediate Shipment — Subject to Prior Sale.

Model 1-W well drill, demonstrator, reconditioned and repainted. Harvester U-1 gas engine with complete starting, semi-trailer mounting, piston type jetting pump, conventional rotary table and drive, 13' Kelly, 5⅝" Mills Si-Ex finger bit, 2" NPT.

Assortment jetting hollow rod and cable tools for 2" and 4" holes, casing elevators for 1", 2" and 4" pipe, 4" drive shoe and other miscellaneous material. Sale price complete: $4580. F.o.b. South Milwaukee, Wis. Write, wire or phone today for full information, Bucyrus-Erie Company, Well Drill Sales, South Milwaukee, Wis. Phone: SO-2-0900.

1—Portadrill #502 rotary drilling machine. Was new in June 1957—Has only drilled 4 wells approx. 500' deep ea.—Equipped with: 4 x 8 Gardner Denver pump — double drum drawworks — 7½" opening in table—1200' of new ⅜" plow-steel sandline—800' of 2⅞" internal upset drill rod — all necessary subs 1—12¼", 2—13¾", 2 — 9⅞", 2 — 7⅞" Hughes & Grunner drill bits — 1—4¾" x 10' drill collar-rig mounted on new 1957 Ford F-800 truck. Box 716

1955 Model 20-W, mounted on 1946 Ford 1½-ton with spooling device and starting equipment. Price: $3500.

1953 Model 20-W, complete rebuilt Hercules motor, tool guide, casing reel, spooling device, 400' wire lines, mounted on 4 x 4 Army truck with 4" tools. Price: $4000.

Contact: Matlock Brothers, 4807 Plainfield Ave., Indianapolis, Ind. Phone Chapel 4-5804.

DRILLS FOR SALE

Model 501 Portadrill truck mounted rotary rig. Rated capacity 1500' in 8" diameters or larger diameters to shallower depths. Good 1954 Ford F-600 truck with two-speed axle. Gardner Denver pump. Reversible hydraulic pull-down. 650' 2⅞" drill rods, 15' long. 1200 gal. water truck with two-speed axle. About 20 drill bits, tools, etc. Priced to sell. Box 717.

22-W Bucyrus-Erie, truck mounted; 2-speed rear axle. Good condition, now running. Tools for 4", 6" and 8" wells. Price: $4500. Must be seen to be appreciated.

Largest tool sale in company history. Acres of cable tools; must be sold. Over $50,000 worth of 4" to 36" tools, bits, reamers, mud scow, bailers, pipe trailers and threaders, etc. Air compressors (Sullivan) for sale, 315 c.f.m. mounted on International truck; ready to go for $1500.

240 Star complete with tools and truck, both in very good condition.

24-L Bucyrus-Erie machine, diesel power, mounted on Indiana 6 x 6, winches, power hoist, etc.

Barney A. Moravec, Penn Yan, N.Y. Phone: 390.

One 20-W Bucyrus-Erie machine, one year old, one-piece derrick, excellent condition, mounted on a 1951 Dodge with 2-speed axle; 500' of ⅝" and 500' of 7/16" cable and complete tools. Harvey Acker, Hales Corners, Wis. Do not write; phone ORchard 2-5667.

36-L Bucyrus-Erie spudder with 54' telescoping derrick, casing tackle strut, powered by Waukesha GK-140 engine with butane equipment, steel folding flaps to provide shelter around rig, skid mounted, can be converted to trailer mounting, tools available for drilling up to 24" dia. holes. Full particulars will be furnished upon request. Cable Tool Supply Co., P.O. Box 305, Highway 64 E., Princeton, Ind. Phone: Fulton 5-4832.

Ideco No. 6 mounted on International truck, 32' telescoping derrick, catheads, extended shaft for jetting pump, complete string 2"-3" API and 4" API tools with forge. Price: $4800. Contact: Richard Robinson, Cedar Lake, Ind. Phone: 7274.

DRILLS FOR SALE

2—Star 55 drills, both 2½ years old, both on FWD 2½-ton trucks, each with 4″ tools and cable. Price each: $4850.

1—Star 71 drill, 40′ mast, on FWD 2½-ton truck, with cable, no tools. Price: $2500.

Midwest Well Drillers, 1501 Pratt Ave., Des Plaines, Ill. Phone VAnderbilt 4-1013.

22-W Bucyrus-Erie purchased new in 1954. Mounted on good truck and drill is equipped with casing reel, spooling device, complete electric starting and tool guide. Complete drilling tools, fishing tools and lines for 6″ and 8″ work. Everything in A-1 condition, and priced to sell quickly. Harry Van Duynhoven, Orange Farm Road, Goshen, N.Y. Phone: 94-R-2.

22-W Bucyrus-Erie '56 model, drilled six wells, on 2-ton truck. Fully equipped. Near Canadian border.

Box 720

20-W Bucyrus-Erie, purchased new late 1956; mounted on 1948 2-ton COE Ford truck with new motor. Drill equipped with complete starting equipment, tool guide, spooling device, casing reel, blower and complete tools and lines for drilling 6″ diameter wells. Excellent condition. Price: $6000. Eastern Drilling Co., 79 West St., Warwick, N.Y. Phone: 55-4127.

22-W Bucyrus-Erie mounted on Mack truck; complete new jack shaft assembly installed last year. Equipped with tools and lines for drilling 6″ diameter wells. Complete outfit in good condition. Price: $4500. Ernest D. Conrad, Rt. #1, Macungie, Pa. Phone: Woodring 5-8722 or 5-5200.

1-W drill serial #114481. Purchased new in August, 1957. Mounted on good GMC 1½-ton truck with catwalks, tool carrying rack and tool box. Drill equipped with complete starting equipment and tools and lines for drilling 2″ dia. wells plus jetting hoses. Can be purchased reasonably with or without truck, tools or lines.

Box 722.

50 Keystone mounted on K-7 International truck. Drill equipped with 6-cylinder Continental gasoline engine, casing reel, tool guide, and complete tools and line for drilling 6″ wells. Approximately 3 years old. Price: $5000. H. E. Shirley, Stephenson, Va. Phone: MOhawk 2-8375.

DRILLS FOR SALE

71-Star mounted on 49 Ford truck, power derrick, complete with cables and 2 strings tools. $3250 complete. W. J. Dillon & Son, 1816 "I" St., Bedford, Ind. Phone: 5225.

1—1954 Model 22-W drill mounted on a 1950 Chevrolet truck. Casing reel, spooling device and power derrick hoist. This machine has been cleaned and painted and is in A-1 shape. Price: $4995 cash at Jacksonville. No tools or lines.

1—1942 Model 22-W drill mounted on a 1946 K-6 International truck. Truck and drill extra good. Casing reel, spooling device and power derrick hoist. No tools or lines. Truck and drill newly painted. Price: $3500 cash.

1—1953 Model 20-W drill, truck mounted, no lines or tools. Price: $3500 cash.

New Bucyrus-Erie 20-W drill, complete with 700′ of ⅝″ drill line, 700′ of ⅜″ sand line and 130′ of casing line. Mounted on a 1951 Dodge truck. All in A-1 shape. Contact R. R. Long Co., or L. J. Kessler, Troy, Mo.

1—Late 1955 Model 60-L drill, 2 International winch trucks, 3 strings of drilling and fishing tools, 3000′ of ¾″ drill line, 1000′ of sand lines, tool shed and many miscellaneous items too numerous to mention. This is a complete oil field outfit. Price: $20,000. Contact R. R. Long Co., or S. & S. Oil Co., Springfield, Ill.

Contact us for all of your needs in well drills. R. R. Long Co., R. R. #1 Mound Rd., Jacksonville, Ill. Phone: CHestnut 5-2613.

Armstrong 33, all steel drill, semi-trailer, with Chevrolet towing truck. Price: $2500 plus tax.

Bucyrus-Erie 21-W, truck mounted. Good bargain at $2500 plus tax.

Contact the Straker Supply, Mt. Pleasant, Mich. Phone: 33-411.

1—1948 Bucyrus-Erie 24-L drill. Machine equipped with 326 Buda, electric starting, power derrick hoist, casing tackle strut, tool crane, trailer mounted. Machine has been through shop, cleaned and repainted. Contact The Buckeye Supply Co., Zanesville, Ohio.

1953 20-W with or without tools on a 1949 Ford truck. Write or call: L. L. May Drilling Co., 818 Michigan Ave., South Milwaukee, Wis. Phone: SO 2-3387.

DRILLS FOR SALE

50 Keystone mounted on International truck and equipped with Continental power unit; 38′ derrick. Available with or without tools and lines for drilling 6″ diameter wells. Complete outfit in A-1 condition and priced to sell. Joseph Kopyar, Savitch Rd., Binghamton, N. Y. Phone: BInghamton 4-0747.

Model 42 Cyclone well drill on 49 Chev. truck in excellent condition; all tools included, some new; drills 4¼″ and up. Price $3100. Lawrence C. Potts, R.R. #5, Defiance, Ohio. Phone: 3-1132.

42 Cyclone, truck-mounted on GMC 2 x 4. No tools. Pictures and complete information on request. Price: $2995. Joseph A. McKay Drillers, 3955 Grand Avenue, Allison Park, Pa.

Four 20-W rigs and 1 22-W. All late models, in perfect condition. Mounted on late model trucks with or without tools. Priced from $4500 up. AAA Well Drilling & Supply Co., 3780 Gordon Rd. SW. Atlanta, Ga. Phone: Plaza 5-5298.

31 Stone drill, 1950. Mounted on truck. String of 6″ tools, with extras. 1″ to 8″ bit. Good condition. Price: $1995. Davis-Cassada Drilling Co., Box 277, Somerset, Ky. Phone: 854XW.

36-L Bucyrus-Erie spudder on skids or trailer mounted. Near Chicago. Excellent condition; gas-gasoline. Box 718.

24-L Bucyrus-Erie drill, 1949 model, mounted on 6 x 6 Army truck, has casing reel, tool crane, 600′ of drill cable and sand line, two 8″ bits with 4½″ pins, 5″ x 16′ stem, bailer, wrenches. Equipment in excellent condition; price $6000. Columbia Pump & Well Co., 318 Rittenhouse St., N.W. Washington 11, D.C. Phone: Randolph 3-3658.

50 Keystone, mounted on '49 Chev. truck. New V-belts and pulleys on motor drive. New V-belts on powerside. Continental 6-cyl. motor with less than 100 hours. Cheap. Box 719.

Model 55A Speedstar with International U-2A engine. Electric starting; unmounted, drilled less than 1000′. Being sold to settle business. Best offer takes. Located north of Chicago. Box 721.

DRILLS FOR SALE

50 Keystone. Mounted on 5-ton White truck. Machine equipped with 36′ derrick power raised, tool guide, blower and drilling and sand lines. Good condition throughout. Price: $3000; with 6″ tools, $3500. Contact: Henry Eager & Sons, RFD #1, Franklin, Conn. Phone: NOrwich-TAlbot 2-6254

Keystone #50, mounted on Diamond T cab-over-engine truck; 42′ telescoping derrick, powered by new Ford industrial six-cylinder engine; new cable; a complete set of 6″ tools; machine, truck and tools, in very good condition. Price complete ready to work $2800; without tools, $2300. North Jersey Artesian Well Drilling Co., Minnisink Rd., Totowa Boro, N.J. Phone: LA 5-2634 — Ar 4-1335.

1—240 Speed Star '46 Model, with 32′ one-piece mast, power hoist, mounted on long wheel base GMC 1½-ton cab-over-engine truck. Price: $2000. Howard B. Clapsaddle, 319 Catherine St., Ann Arbor, Mich.

Model 71 Speedstar mounted on GMC 4 x 4 truck with 500′ new ⅝″ drilling line and 500′ new ⅜″ sand line. Rig completely overhauled and painted, has new F162 Continental motor and Bucyrus-Erie shock in top of mast. Priced for quick sale. Ray G. Scott, Rt. 5, Ravenna, Ohio. Phone: Ravenna AX69119.

For Sale: 20-W, about four years old, in first class condition and mounted on a good 1948 Ford truck. Price: $3300. B. L. Zander, Coulter, Iowa.

When writing advertisers, please say you saw it in The Driller.

DRILLS FOR SALE

Bucyrus-Erie 21-W drill on 1957 Chev. truck. Has been well maintained. In good operating condition throughout. Now working. Asking $2200. Contact: Larson-Becker Co., Batavia, Ill. Phone: Batavia 1316 and 1317.

Cyclone, model 35 equipped with LeRoi engine, jetting pump and tank. Mounted on 1-ton Ford truck. Outfit in excellent condition. Price complete, $1500. If jetting equipment is not desired, $1375. E. McGinnis & Sons, 502 New Jersey Ave., Absecon, N. J. Phone: PLeasantville 1949.

Keystone 70 mounted on 1941 GMC 6x6, 6-wheel drive, fully equipped with 6″ tools and lines. Steal this machine for $2500 and go to work tomorrow. Rogue Valley Drilling Co., 885 Shafer Lane, Medford, Ore. Phone: SP 2-7372.

20-W, one-piece derrick with complete string of 6″ tools; 500′ of drilling cable, 500′ of sand line; new engine installed approximately one year ago; mounted on '47 Chevrolet truck. Contact Ed Kranz, 5214 W. Villard St., Milwaukee, Wis.

MISCELLANEOUS FOR SALE

22-W Bucyrus-Erie bought August 1957. Mounted on 1953 Int. truck—A-1 condition, with calf line and rubber mounted sheaves. Sand and drilling lines if desired.

22-W Bucyrus-Erie trailer mounted 1954. Motor completely overhauled. Calf line and rubber sheaves.

2000′ of new ⅝″ drill line 6x21. Run in an 1800′ hole once. $500.

1—8″ under digger 2¼ x 3¼ joint used once. $230.

L. F. Winslow, R. R. 1, Walcott, Iowa.

New and used pipe and casing. Tom's Well Driller Supplies, 933 Fern Ave., Reading, Pa. Phone: SPruce 7-6331.

Double-acting pump. One A. D. Cook double-acting water pump with 126′ of 5″ drop pipe and 4¾″ brass cylinder complete with rods and plunger. Capacity, 60 gal. per min. with three-phase 5 hp motor and starting switches. Pump in good condition. Apply to Genz & Ryan Plumbing, Rosemount, Minn.

Spudders, rotaries, tools. Nation wide sales listings. If buying or selling contact Pressey & Son, P.O. Box 614, Pueblo, Colo.

MISCELLANEOUS FOR SALE

FORD MODEL JD-1025 GASOLINE ENGINE with radiator-flywheel, ring gear and starter. $200.

* All Prices f.o.b. South Milwaukee, Wisconsin

Bucyrus-Erie Company, South Milwaukee, Wisconsin.

Complete string of big hole tools with 8″—10″ and 12″ bits. Joints 2½″ x 3½″-7 API.

New: Universal Giant #101-AA clutch, shaft, sprockets, chain and drum.

Temper screw with clamps.

8″ and 10″ pipe with coupling. Reasonably priced. Alexander Blote, 13-14 River Road, Fair Lawn, N. J. Phone: SW 6-0570.

New pipe casing in stock: 3″, 4″, 6″, 8″, 10″, 12″. Reconditioned pipe casing in stock: 3″, 4″, 4½″, 5″, 6″, 8″, 10″, 12″. Cutting and threading facilities; attractive prices on request. H. Schwartz & Sons, 2235 North Bodine St., Phila., Pa., Garfield 6-6464.

EQUIPMENT WANTED

Want to buy 22-W and tools, late model, less truck. Clifford Reed, R.D. 3, Oneonta, N. Y. Phone 945-J.

50 Keystone or 22-W, 24-L or 60-L with or without tools or truck. Philip Sylvia, Little Compton, R. I.

Wanted: Used 22-W drilling outfit. Must be in good condition. Contact: Howard Beck. Lebanon, Mo.

Bucyrus-Erie 22-W or 50 Keystone with or without tools. John Nasner, Selkirk, N. J. Phone: Roger 7-3122.

HELP WANTED

Experienced, reliable cable tool driller for rock and screen work. Stewart Bros. Inc., P.O. Box 976, Schenectady, N.Y.

Pump Salesman for shaft turbines, submersibles and strainers. Some installation and well experience desirable. Pa., Jersey, Md., Del. area. Give qualifications and salary desired. A. J. Nicholas & Co., Inc., 2908 W. Fletcher St., Phila. 32, Pa.

Geology...

(Continued from page 59)

strata which carry some water. Because these narrow banks of sand and gravel may not be very reliable as permanent installations, it usually is undesirable to finish a well in them. Generally, in deep beds of sand and gravel, the finer particles will lie toward the surface while the coarser particles, because of their weight, will be toward the bottom. For best results, a driller should attempt to terminate his well in the lower regions of such formations.

3. Consolidated Formations. One of the most important of the sedimentary rocks is sandstone. Sandstones vary widely in texture, color, and hardness. When clay is the cementing agent holding the grains of sand together, sandstone is practically ruined as a water producer, but it may be a very good producer if the cementing agent contains silica, calcium carbonate, or even iron oxide.

4. Limestone. Certain limestones are another important source of water in the sedimentary rocks. The structural range of limestone is enormous and its range ability to yield water is equally great. Usually the younger or newly formed limestone will contain wider openings between the particles, such as we find in underground caves, and it may contain water-bearing fissures or seams. Older limestone deposits, on the other hand, usually don't have these openings and therefore are not good producers of water. The chief ingredient of limestone is calcium carbonate, which is readily dissolved in water. Marble or dolomite is a limestone rich in magnesium, and may possess some water in its fissures or cracks. Chalk, calcareous shale, marl, and caliche are also limestones, but cannot be classed as good or reliable sources of water. Some of the best limestone wells on earth may be found in Cuba, where yields over 5,000 gpm are not uncommon.

5. Basalt. When in geologically "new" beds, basalt is a good source of water because, like lava, it spreads in sheets over large areas and may have the appearance of a sponge. But in older beds it is likely to be close grained, formed either by pressure or by being filled with other material, and therefore will not yield any great quantities of water.

6. Granites, Porphyries, etc. Granites, porphyries, and like kinds of the hard, crystalline types of igneous rocks are not regarded as good waterproducers.

7. Metamorphic Rocks. These are generally the poorest water producers of all. They include the gneisses, schists, quartzes, slates, serpentines and soapstones, all of which have originated either from sedimentary or igneous rocks.

Today, because of the work done by government geological departments, private companies specializing in geological surveys, water well contractors, and equipment manufacturers, we are indeed fortunate in having a tremendous amount of information about underground formations. It should be pointed out, however, that no investigation of underground water supplies is complete without the substantiating evidence of actual test. Once a test has been made, the findings can be correlated with available geological data of the region to obtain an approximate expected yield. Hole diameter can then be determined, and selection of the proper machine and its related equipment can be made.

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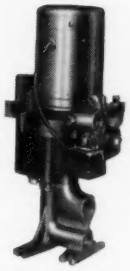

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